MONTANA OIS FEASIBILITY STUDY

FINAL REPORT

Program Resources, Inc.

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Prepared for the Montana State Occupational
Information Coordinating Committee

by

Program Resources, Inc.
Rockville, Maryland

MONTANA OCCUPATIONAL INFORMATION SYSTEM FEASIBILITY REPORT

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MONTANA OCCUPATIONAL INFORMATION SYSTEM FEASIBILITY REPORT
EXECUTIVE SUMMARY

The purpose of this report is to identify the feasibility of developing an occupational information system (OIS) in Montanta. The report is divided into five chapters that are described below.

Chapter 1 . OIS-Related Reports--Four reports have been prepared for the Montana SOICC as a part of this OIS Feasibility Study. In addition to this report, the following documents have been produced:

- Montana Occupational Information Sources: Publications, Programs, and Reporting Systems--This document describes 50 major sources of occupational information produced by local, State, or federal agencies.

- Montana Occupational Information Needs Survey--This report contains the results of a survey of 100 Montana occupational information users. Survey respondents provided their ratings of the importance, availability, use, and training needs for selected information topics. The highest rated topics were analyzed for coverage by Montana sources.

- Montana Occupational and Education/Training Clusters--This project, scheduled to be completed in March, is designed to relate the classification systems used by Montana SOICC agencies in a series of clusters. These clusters are being developed to reflect Montana education/training and employment patterns and are being reviewed by agency personnel.

Chapter 2 Data Components of a Montana OIS--Four data components are described that can be included in a Montana OIS. Each component is presented, in detail, in separate sections describing the purpose, Montana data sources, data limitations, and issues for OIS development. The four data components include:

- Occupational Demand
- Occupational Supply
- Occupational Characteristics
- Complementary Information

Chapter 3 Operational Components of a Montana OIS--This chapter describes how the data components described above can be related and analyzed. This discussion focuses on the following components:

- Occupational Supply/Demand Interface--This process uses the results of the above cluster project to relate source data from the occupational supply and demand components.

- Occupational Supply/Demand Analysis--This process involves the analysis, interpretation, and explanation of the supply/demand interface and uses occupational characteristics and complementary information as well as supply and demand data.

Chapter 4 OIS Design Alternatives: Procedures, Schedules, and Costs--This chapter presents three alternative OIS designs that could be used to integrate the OIS components described above. Also described are the schedules and costs associated with each design.

- Level I--Manual OIS Design--This system involves extracting appropriate supply/demand data from Montana sources, interfacing this data using the Montana clusters, and analyzing and reporting the results. All these activities would be done manually.

- Level II--Automated OIS Design--This system is similar to Level I except the interfacing, analysis, and report preparation are computer processed.

- Level III--Automated OIS Design--This system is similar to Level II except data entry is automated (to the extent possible) and additional computer analysis and reporting are possible.

Chapter 5 Issues and Recommendations--This chapter presents a series of recommendations for resolving technical and implementation issues facing the Montana SOICC in its OIS design deliberations. It also identifies suggested roles for the Montana SOICC in the following three areas:

- Clearinghouse
- Improving Data
- Producing Supply/Demand Reports

CHAPTER 1--OIS RELATED REPORTS

This report is one of four reports that are being prepared for the Montana State Occupational Information Coordinating Committee (SOICC) by Program Resources, Inc. (PRI) of Rockville, Maryland. The other three reports describe occupational information needs, resources, and clusters for supply/demand analysis. This report describes the components of an occupational information system (OIS) and provides the Montana SOICC with several OIS design alternatives. These alternatives are analyzed in terms of the data coverage, cost and implementation problems, and agency roles. The discussion of the OIS implementation is based on the results of three previous reports that have been produced as a part of this OIS feasibility study. The reports that have been developed in the course of this study are described below:

- Montana Occupational Information Sources: Publications, Programs, and Reporting Systems--This document is an inventory of 50 major occupational information sources in Montana. Each source is presented using the following major topics:

  - Description
  - Uses
  - Time Period Coverage
  - Geographic Coverage
  - Occupational Coverage
  - Frequency of Publication
  - Availability/Cost
  - Publishing Agency Contact

  The publications and programs described in the inventory were prepared by a variety of State and federal agencies. The descriptions of the State publications were reviewed by responsible personnel to ensure accuracy. An agency index and a subject index are included for convenient information accessing.

- Montana Occupational Information Needs Survey--The survey was designed to document the occupational information needs and preferences of Montana education and training personnel. The survey instrument was distributed to 100 representative personnel in September of 1980. A total of 92 completed surveys were returned and analyzed in the survey report. The survey instrument contained the following major sections:

  - Respondent Information--Data on the employer, agency, and position of the respondent was collected. Individual names were not collected.

  - Data Importance, Availability and Use--Respondents were given a list of 26 occupational information topics, grouped in four major areas, and were asked to rate each of them on a four-point scale in terms of importance, availability, and use.

- Data Application and Training Needs--Respondents were asked to identify the areas in which they used occupational information (data application) and to rate their need for training in four major areas.

- Comments--An "open-ended" section was provided for comments on the survey and user information needs.

The Needs Survey report describes the survey development, survey data analysis and findings and presents all the comments provided by respondents.

A special analysis was made of the most highly-rated topics and the coverage of publications in the Montana Occupational Information Sources. It was found that at least four sources existed that addressed, in some form, the highly-rated topics. This suggests that personnel interested in occupational information should receive more communication and training on the coverage of existing materials. The conclusions and limitations of the Needs Survey are presented in the appendix of this report.

Montana Occupational and Education/Training Clusters--This activity will produce a number of clusters (approximately 40-60) that relate the classifications systems used by the major data sources of occupational supply and demand in Montana. The coverage of each cluster will define the units of supply/demand analysis to be used in the proposed OIS. The clusters are designed to include the major vocational education, vocational rehabilitation, CETA, and employment service, education and training programs.

The process being used to develop these clusters includes the following steps:

- Develop preliminary clusters--These were developed based on the classification systems used by Montana supply and demand sources and the relationship between these classifications suggested by national crosswalks (e.g., NOICC's Vocational Preparation and Occupations). A total of 58 different clusters were presented. (See the Appendix of this report for the preliminary titles of these clusters.)

- Conduct crosswalk workshop--The preliminary clusters were reviewed at a two-day workshop attended by more than 40 Montana agency personnel. These personnel critically reviewed the clusters based on their knowledge of curricula, job placement outcomes of programs, and occupational entry requirements. This review resulted in the revision of the coverage and number of clusters.

- Prepare final review of clusters--This activity, to be conducted in February 1981, will allow workshop participants to review the clusters identified in the workshops. (Samples of the cluster format are presented in the Appendix.)

- Prepare final cluster report--Based on the final review, a report will be prepared which will contain:

  - The final clusters

  - A listing of the classification systems used by major Montana agencies producing occupational supply and demand information and the clusters they have been assigned

  - A description of the process that was used to develop these clusters

The cluster project is important for occupational supply/demand analysis. Its use is described in Chapter 3--Occupational Components for a Montana OIS. The final cluster report will be submitted to the Montana SOICC in March, 1981.

CHAPTER 2--DATA COMPONENTS OF A MONTANA OIS

The purpose of this chapter is to describe the data components of an OIS. As an introduction, a brief description of an OIS is provided. The National Occupational Information Coordinating Committee (NOICC) has provided the following definition of an occupational information system (OIS):

> "An information system may be thought of as an organization or network for the collection and/or distribution of information. For NOICC/SOICC purposes, the information being collected and distributed is related to occupations. An occupational information system should be conceived in generic terms--that is, there are many similar yet distinct methods of structuring the organization or network that will satisfy the systematic functions of collecting and/or distributing occupational information. Regardless of the OIS operational environment that is established, the basic purpose of every State's (Occupational Information) system will be the same. That purpose, simply stated, is to provide users the occupationally related information necessary for decisionmaking."[1]

In considering the development of an OIS, it is necessary to recognize two major user groups that the system should serve:

- Vocational education and employment and training program planners and administrators
- Students and clients in the career exploration and decision-making process and the counselors and placement personnel assisting them

To meet the needs of these user groups an OIS should contain several types of information on a number of occupations. NOICC has identified four major components or types of information that should be in an OIS. These include:

- Occupational Demand information
- Occupational Supply information
- Occupational Characteristcs information
- Complementary Information

Exhibit 2-1 presents a NOICC chart that displays these components and a number of possible sub-components. This chapter describes the four data components for a Montana OIS. The discussion of sub-components is limited to those for which information is available in Montana. The description of each component address the following topics:

[1] NOICC, A Framework for Developing an Occupational Information System, 1978.

EXHIBIT 2.1

OIS INFORMATION BASE AND THE TWO MAJOR USES OF OCCUPATIONAL INFORMATION

OCCUPATIONAL INFORMATION BASE

1 INTRODUCTION

2 OCCUPATIONAL DEMAND
- 2.1 CURRENT OCCUPATIONAL DEMAND
  - 2.1.1 CURRENT OCCUPATIONAL EMPLOYMENT
  - 2.1.2 JOB VACANCIES
- 2.2 PROJECTED OCCUPATIONAL DEMAND
  - 2.2.1 PROJECTED OCCUPATIONAL DEMAND–LONG TERM
  - 2.2.2 PROJECTED OCCUPATIONAL DEMAND–SHORT TERM
- 2.3 OCCUPATIONAL TRANSFERS AND GEOGRAPHIC MIGRATION
  - 2.3.1 OCCUPATIONAL TRANSFERS
  - 2.3.2 GEOGRAPHIC MIGRATION

3 OCCUPATIONAL SUPPLY
- 3.1 CURRENT OCCUPATIONAL SUPPLY
  - 3.1.1 CURRENT OCCUPATIONAL EMPLOYMENT
  - 3.1.2 CURRENT UNEMPLOYMENT BY OCCUPATION
- 3.2 ENTRANTS TO OCCUPATIONAL SUPPLY FROM EDUCATION/TRAINING PROGRAMS
  - 3.2.1 ENROLLEES, COMPLETERS, AND LEAVERS
  - 3.2.2 FOLLOW-UP SURVEYS AND STUDIES
- 3.3 OTHER SOURCES OF ENTRANTS TO OCCUPATIONAL SUPPLY
  - 3.3.1 AGENCY REGISTRANTS
  - 3.3.2 NEW ENTRANTS AND REENTRANTS TO CIVILIAN LABOR FORCE
- 3.4 OCCUPATIONAL TRANSFERS, GEOGRAPHIC MIGRATION AND LABOR FORCE SEPARATIONS
  - 3.4.1 OCCUPATIONAL TRANSFERS
  - 3.4.2 GEOGRAPHIC MIGRATION
  - 3.4.3 LABOR FORCE SEPARATIONS

4 OCCUPATIONAL CHARACTERISTICS
- 4.1 NATURE OF THE OCCUPATION
  - 4.1.1 TITLES, DEFINITIONS, AND DUTIES
  - 4.1.2 MACHINES, TOOLS, EQUIPMENT, AND WORK AIDS (MTEWA)
  - 4.1.3 MATERIALS USED, PRODUCTS MADE, SUBJECT MATTER DEALT WITH, OR SERVICES RENDERED (MPSMS)
  - 4.1.4 RELATED OCCUPATIONS AND CLUSTERS
- 4.2 WORKING CONDITIONS
  - 4.2.1 ORGANIZATIONAL ENVIRONMENT
  - 4.2.2 PHYSICAL ENVIRONMENT
  - 4.2.3 SCHEDULE AND HOURS
- 4.3 PERSONAL REQUIREMENTS
  - 4.3.1 INTERESTS
  - 4.3.2 TEMPERAMENTS
  - 4.3.3 APTITUDES AND ABILITIES
  - 4.3.4 PHYSICAL DEMANDS AND CAPABILITIES
- 4.4 EDUCATION AND TRAINING REQUIREMENTS
- 4.5 LICENSING, CERTIFICATION, AND REGISTRATION REQUIREMENTS
- 4.6 METHODS OF EXPLORATION, ENTRY, AND ADVANCEMENT
  - 4.6.1 METHODS OF EXPLORATION AND GAINING EXPERIENCE
  - 4.6.2 METHODS OF ENTRY
  - 4.6.3 METHODS OF ADVANCEMENT
- 4.7 EARNINGS AND FRINGE BENEFITS
  - 4.7.1 FACTORS AFFECTING EARNINGS
  - 4.7.2 NATIONAL, STATE, AND LOCAL EARNINGS
  - 4.7.3 FRINGE BENEFITS
  - 4.7.4 SUPPLEMENTAL INCOME
- 4.8 EMPLOYMENT PROFILE
  - 4.8.1 OCCUPATIONAL DEMOGRAPHICS
  - 4.8.2 JOB STABILITY
  - 4.8.3 TURNOVER/NEW HIRES
  - 4.8.4 INDUSTRIAL CONCENTRATION
  - 4.8.5 DEGREE OF UNIONIZATION
- 4.9 INFORMATION SOURCES
  - 4.9.1 PRIMARY SOURCES
  - 4.9.2 SECONDARY SOURCES
  - 4.9.3 BIBLIOGRAPHICAL SOURCES

5 COMPLEMENTARY INFORMATION
- 5.1 EDUCATION AND TRAINING AUXILIARY INFORMATION
  - 5.1.1 EDUCATION AND TRAINING INSTITUTIONS
  - 5.1.2 EDUCATION AND TRAINING PROGRAMS
  - 5.1.3 FINANCIAL ASSISTANCE PROGRAMS
- 5.2 DEMOGRAPHICS AND ECONOMIC CONDITIONS
  - 5.2.1 DEMOGRAPHICS
  - 5.2.2 LABOR FORCE, EMPLOYMENT AND UNEMPLOYMENT TRENDS
  - 5.2.3 LABOR TURNOVER AND COMMUTING PATTERNS
- 5.3 OTHER STATE-IDENTIFIED INFORMATION

6 AUXILARY INFORMATION NECESSARY TO SUPPORT OCCUPATIONAL SUPPLY/DEMAND ANALYSIS (SEE VOLUME 2)

TO SUPPORT THE PLANNING PROCESS FOR EDUCATION AND TRAINING PROGRAMS

⇩ USERS

PLANNERS AND ADMINISTRATORS

TO SUPPORT THE CAREER PLANNING, GUIDANCE, AND JOB SEARCH NEEDS OF VARIOUS TARGET POPULATIONS

⇩ USERS

DIRECT PARTICIPANTS IN THE LABOR MARKET

LABOR MARKET INTERMEDIARIES

SOURCE: NOICC--Occupational Information System Handbook, 1981

- Conceptual introduction
- Purpose of the data component
- Sources of information for this component in Montana
- Availability and limitations of information in Montana
- Issues in the development of the data component

The following table indicates the pages and exhibits included in the discussion of each of the OIS data components.

Table 1: OIS Data Components

Data Component	Following Page	Exhibits
Occupational Demand	-6-	Exhibit 2-2--Sources of Occupational Demand Information in Montana
	-6-	Exhibit 2-3--Availability and Limitations of Occupational Demand Information in Montana
	-6-	Exhibit 2-4--OES-Survey-Based Matrix vs. OES Census-Based Matrix
Occupational Supply	-10-	Exhibit 2-5--Sources of Occupational Supply Information in Montana
	-10-	Exhibit 2-6--Availability and Limitations of Occupational Supply Information in Montana
	-10-	Exhibit 2-7--Duplicate Counts in Supply Data
	-10-	Exhibit 2-8--Occupational Mobility, Geographic Migration, and Turnover by Occupation
Occupational Characteristics	-11-	Exhibit 2-9--Sources of Occupational Characteristics Information
	-11-	Exhibit 2-10--Development of a Career Information Delivery System
Complementary Information		None

(1) Occupational Demand Component

Conceptual Introduction: This component contains information on the current employment and anticipated job openings in specific occupations, within a specific geographic area, over a given period of time. Job opportunities may be affected by several factors, including:

- Expansion or reduction in the economy over time
- Replacement of workers leaving the labor force over time because of death, retirement, or other reasons
- Transfers of persons to different occupations
- Lateral movements of persons within occupations
- Migration by individuals from the specific geographic area being analyzed
- Technological changes
- Plant openings and closing

Purpose of the Component in the Montana OIS: The purpose of the occupational demand component in the Montana OIS is to provide estimates by occupation for:

(1) Current employment
(2) Current vacancies
(3) Projected job openings

These items are among those rated as being most important by the respondents to the Montana Occupational Information Needs Survey.

Sources of Information for this Component in Montana: Exhibit 2-2 depicts the sources of occupational demand information in Montana. The major sources of existing occupational demand information in Montana are provided through the Employment Security Division of the Department of Labor and Industry.

Availability and Limitations of Information in the Montana OIS: Exhibit 2-3 depicts the same sources of information reflected in Exhibit 2-2, but also discusses the uses and limitations of the demand information in an OIS. Also presented in this table are comments on the availability of information from each data source or system that contains information that will be used in the OIS.

EXHIBIT 2-2
SOURCES OF OCCUPATIONAL DEMAND INFORMATION IN MONTANA

Organization	Data Source/Program	Available Information	Coding Structure	Geographic Detail
Employment Security Division	Occupational Employment Statistics (OES) Program	Estimates of current and projected employment and projected average annual openings by occupation	OES Census-based or Survey-based matrix code (8-digit)	State and 2 SMSAs (for Census-based)
Employment Security Division	Employment Security Automated Reporting System (ESARS)	Table 96 presents a summary of job openings (orders) by occupation	Dictionary of Occupational Titles (DOT) (3- and 9-digit)	Local Offices

EXHIBIT 2-3
AVAILABILITY AND LIMITATIONS
OF OCCUPATIONAL DEMAND
INFORMATION IN MONTANA

Organizational Responsibility and Data Source/Program	Information Use and Limitations	Information Availability
Bureau of Labor Statistics (BLS) and Employment Security Division--Occupational Employment Statistic (OES) Matrix	The OES Industry/Occupation Matrix system is the principal source of occupational demand information. In Montana, the Census-based matrix is used to produce reports for the State and two SMSAs. The more detailed Survey-based matrix is still under development. The methodology for producing the sub-State Survey-based matrix has yet to be finalized. The Survey-based matrix will not have sub-State data available in the near future.	The OES matrix is processed on the BLS computer. Tapes and tape formats are available for the complete matrix. Information must be extracted from a current year and projection year tape file and combined. Reduced technical assistance from the BLS in the future may limit use of the Survey-based matrix.
Employment Security Division--ESARS Table 96--Openings	The cumulative listing of openings submitted by employers to local Job Service offices is a useful adjunct to occupational demand projections. It should be noted that Job Service openings represent only a portion of the total actual openings in an occupation.	The ESARS tables are produced as printouts in Montana.

Issues in the Development of this Data Component: There are several basic issues in the development of the demand component of the OIS that must be addressed in the design process. These include:

- OES Survey-based matrix vs. the Census-based matrix
- Selection of the geographic areas for which occupational demand information, both current and projected, will be developed
- Resolution of the cross-coding problems introduced by the uncertainty of the specific occupational demand information that will be used in the OIS

The first issue, OES Survey-based matrix vs. the Census-based matrix, is discussed in detail in Exhibit 2-4. The recommendation in the exhibit calls for the use of the Census-based matrix initially, due to the current availability of data from this system. When data are available from the OES Survey-based matrix, that program should be used. The OES program is recommended because it is based on job counts submitted by employers rather than the less reliable "person-based" self report of the Census system. It also contains more occupational titles. If the OES program is adopted for the occupational demand component, the SOICC and the Research and Analysis Section will have to identify methods to include sub-State occupational projections and agricultural employment to ensure the usefulness of the data. See Chapter 5 for more discussion of agency roles in improving data.

The decision with respect to this issue affects the resolution of the remaining two issues. The Census-based matrix process currently has the capability to provide information for the entire State and the two SMSA's in the State. The Survey-based matrix process, however, can only provide information for the State as a whole, not for any sub-State areas. The Census-based matrix is limited in detail, having only 377 occupational categories, compared to the increased detail of approximately 1,500 occupational categories in the Survey matrix. Selection of the Census-based matrix would permit generation of State and sub-State occupational demand information, but would constrain the supply/demand analysis because of the limited occupational detail. In contrast, selection of the Survey-based matrix would limit the geographic detail possible, but would permit a more flexible supply/demand analysis because of the increased detail in occupational categories.

EXHIBIT 2-4
OES SURVEY-BASED
MATRIX VS
CENSUS-BASED MATRIX

Discussion:

Two data sources exist that could be used for the projected occupational demand component in Montana's OIS. Both the OES Survey-based Matrix and the Census-based Matrix are produced by the Employment Security Division in cooperation with the Bureau of Labor Statistics. The implementation of an OIS in Montana will require a decision on which data source to use for this component. Shown below is a summary of several key features of each system.

I. Technical Features

	1970 CENSUS-BASED SYSTEM	OES SURVEY-BASED SYSTEM
A.	Industries Included	Industries Included
	All industries	All industries except: . Agriculture services . Agriculture, forestry, fishing . Private households
B.	Industry Classification	Industry Classification
	1967 SIC system for all industries with modifications (Census)	Presently, 1967 SIC system in some industries and 1972 for other industries. (1972 SIC system for all industries in the future)
C.	Classes of Workers	Classes of Workers
	Private wage and salary Public wage and salary . Federal government . State government . Local government Self-employed Unpaid family	Private wage and salary Public wage and salary . Federal government . State government . Local government
D.	Enumeration Concept	Enumeration Concept
	. "Persons" count . 16 years of age or older	. "Jobs" count . No age restrictions

II. Data Availble in Montana

1970 CENSUS-BASED SYSTEM	OES SURVEY-BASED SYSTEM
A. Number of Occupations	A. Number of Occupations
Up to 377	Up to 1500
B. Geographic Coverage	B. Geographic Coverage
. State of Montana . Billings SMSA . Great Falls SMSA	. State of Montana (not presently available)
C. Relationship to Cluster Project	C. Relationship to Cluster Project
Included as one of the primary classification systems	Not presently included

Recommendation:

The National Occupational Information Coordinating Committee (NOICC) has identified the OES program as the principal source of current and projected occupational employment data at the local, State and national level. This is due to the occupational detail available and technical aspects of the data collection. Montana data from the OES program are not yet available.

Based on these considerations and the above discussion, the following recommendations are made:

- For immediate OIS planning and development, it is recommended that the Census-based matrix system be used as the source of projected occupational employment data. This would allow for detailed geographic analysis using existing data that can be directly related to the cluster project.

- For future OIS planning and development, it is recommended that the OES Survey-based system be substituted for the Census-based data when OES data becomes available. This would result in the use of a technically superior data base as identified by NOICC and recognized by labor market analysts in the field.

(2) Occupational Supply Component

Conceptual Introduction: This component contains information on the number of individuals who are working, seeking work or may be seeking work in specific occupations within a specific geographic area, over a given period of time. The current supply of workers for an occupation equals the number of individuals who are qualified for and seeking work in that occupation. The projected supply of workers in an occupation is equal to the current occupational supply plus new entrants to the labor force who seek and/or obtain work in the occupation, less the labor force separations from that occupation. The important conceptual aspects of occupational supply relate to the flow of workers into and out of various occupations. Potential new workers who might enter an occupation include:

- Completers and leavers from training/education institutions and programs
- Unemployed individuals who are available for and seeking work in an occupation
- In-migrants to a labor market
- Individuals transferring from the same or other occupations
- New entrants and reentrants to the labor force

Workers cease to be employed in various occupations for several reasons including:

- Retirement or death
- Transfers to different occupations
- Out-migration from a labor market
- Personal (family or health) reasons

The occupational supply component of the OIS should focus principally on the number of individuals who are available for, qualified for, and seeking employment in specific occupational fields.

Purpose of the Component in the Montana OIS: The purpose of the occupational supply component in the Montana OIS is to estimate the number of individuals who will be available to work in various occupations at specific points in time. More specifically, the occupational supply component must focus on the number of available workers who have skills in specific occupations. To estimate the available supply of workers for occupations for given time periods, information will be necessary regarding current employment, current availables, and potential availables by occupational field. The aspect of supply that is most important is not the element which measures the currently employed, but the element that measures the number of qualified individuals who are available for employment.

Sources of Information for this Component in Montana: Exhibit 2-5 depicts the sources of occupational supply information in Montana. The Montana sources presented measure available supply from training programs and those currently unemployed. It is important to note the lack of consistency across data sources and programs with respect to the classification structures used for coding enrollments, completions, and placements. This lack of consistency across sources of occupational supply must be resolved through a clustering process that groups similar education/training programs and occupational fields together for the purpose of analyzing occupational supply information. This clustering process is described in more detail in the supply/demand analysis component described in Chapter 3. The occupational supply component of the OIS will contain enrollment, completion, and placement information from a variety of data sources.

Availability and Limitations of Information in the Montana OIS: Exhibit 2-6 depicts the same sources of information reflected in Exhibit 2-5 but also discusses the uses and limitations of the occupational supply information in an OIS. Also presented in this table are comments on the availability of information from each data source or system that contains information that will be used in the OIS.

Issues in the Development of this Data Component: There are several major issues in the development of the supply component of the OIS that must be addressed in the design process. Some of these issues are more critical than others and will be presented and discussed in depth in a series of exhibits. The remaining issues will be briefly discussed as to their implications for the development of an OIS. The following table summarizes these issues.

Table 2: Issues in the Development of the Montana OIS Supply Component

Description of Issues	Discussion and Resolution of Issue
Duplication of Counts in Sources of Occupational Supply Information	See Exhibit 2-7
Occupational Mobility, Geographic Migration, and Turnover by Occupation	See Exhibit 2-8
Gaps in Supply Data	Occupational supply information, summarizing enrollments and/or completions by instructional program area or occupational field, are not currently available for several potential sources that might contribute to the supply of workers for an occupation. Data on training programs operated by Tribes in Montana are not included in the sources described.

Description of Issue	Discussion and Resolution of Issue
Gaps in Supply Data (continued)	Training conducted in certain public programs such as the Work Incentive Program, Sheltered Workshops, and the Department of Corrections may be reported in other data collection systems like VEDS, HEGIS, or NCES Postsecondary School Survey. To the extent that their training is not reported in these other systems, these public programs are not represented in supply data. Another significant gap in supply data is the training conducted by employers' in-house training programs. There is no available data source on this type of training. New entrants and reentrants to the labor force are another significant gap in the supply data. They are represented only indirectly by Employment Service job applicants. The above sources should be analyzed each year to determine if information has become available that can be used in an OIS. As a new source of supply information becomes available, the source will have to be integrated into the supply component of the OIS.
Projections of Supply Information	Projections of occupational supply by detailed instructional program field or occupation field of training/education are, at best, very tenuous. Such projections, because of the assumptions on which they would have to be based, would be subject to questions and limited usefulness. Another problem in the development of supply projections is that the reporting systems/programs being utilized for the supply component of the OIS utilize different classification taxonomies making integration of supply projections difficult. In short, the issue of supply projections should be deferred until sufficient historical data are available on which to base such projections. See the discussion in Chapter 5 on the role of SOICC and SOICC agencies in improving data sources.

EXHIBIT 2-5(1)
SOURCES OF OCCUPATIONAL SUPPLY
INFORMATION IN MONTANA

Organization	Data Source/Program	Available Information	Coding Structure	Geographic Detail
Office of the Commissioner of Higher Education	Higher Education General Information Survey (HEGIS)	Enrollments by broad academic discipline and degrees conferred by detailed degree discipline	HEGIS taxonomy (4-digit)	Individual Institution
Office of Public Instruction, Department of Vocational and Occupational Services	Vocational Education Data System (VEDS)	Enrollments, estimated and actual completions, leavers and placements by detailed instructional program code	USOE program code (6-digit)	Individual Institution
National Center for Education Statistics (NCES)	NCES Postsecondary Career School Survey	Enrollments and completions in programs of postsecondary noncollegiate career schools by detailed instructional code	USOE program code (6-digit)	Individual Institution (FIPS county code)
Department of Social and Rehabilitation Services, Rehabilitation Services Division	Vocational Rehabilitation Management Information System (MIS)	Enrollment and placement of rehabilitation clients by occupational fields	DOT (4-digit) (Enrollment) DOT (9-digit) (Placement)	Statewide only Individual Client data available by area from RSA-300
Department of Labor and Industry, Employment and Training Division	CETA Management Information Systems (MIS)	Enrollments, completions and placements by CETA training program	DOT (9-digit)	Prime sponsor
Department of Labor and Industry, Montana Apprenticeship Bureau	State and National Apprenticeship System (SNAPS)	Individuals enrolled in registered apprenticeship programs	DOT (9-digit)	County code (FIPS county code)

EXHIBIT 2-5(2)
SOURCES OF OCCUPATIONAL SUPPLY INFORMATION IN MONTANA

Organization	Data Source/Program	Available Information	Coding Structure	Geographic Detail
Employment and Training Administration, US DOL	Job Corps	Enrollments in training programs at Job Corps Centers in Montana	DOT (6-digit)	Job Corps Center
Department of Labor and Industry, Employment Security Division	Employment Security Automated Reporting System (ESARS)	Table 96 presents a summary of the occupational experience of job service applicants	DOT (9-digit)	Job Service Local Office
Department of Labor and Industry, Employment Security Division	Characteristics of the Insured Unemployed (ES 203)	Occupation of last employment for claimants of unemployment insurance programs	DOT (2- or 4-digit)	Unemployment Insurance local office
Department of Defense and/or Veterans Administration	Separation Notices (DD 214)	Military occupational specialty of individuals separating from military service after any length of service	Military Occupational Specialty Code (has DOT equivalents)	By ZIP Code of Individual

EXHIBIT 2-6(1)
AVAILABILITY AND LIMITATIONS OF
OCCUPATIONAL SUPPLY INFORMATION
IN MONTANA

Organizational Responsibility And Data Source/Program	Information Use and Limitations	Information Availability
Office of the Commissioner of Higher Education--HEGIS 2300-2.1 Parts A, b, & C	The HEGIS surveys provide information on the number of degrees conferred by HEGIS academic degree discipline. Part C of the survey form is particularly useful because it records the associate degrees conferred, many of which are more vocationally oriented.	HEGIS reports are available from the Commissioner's Office or NCES.
Office of Public Instruction, Department of Vocational and Occupational Services--VEDS	The VEDS system provides information on enrollments and completions in secondary and postsecondary vocational programs covered by the State Plan. Plans call for postsecondary follow-up information.	The VEDS data are processed on OPI computer equipment
National Center for Education Statistics--NCES Postsecondary Career School Survey	This survey provides information on enrollments and completions in vocational programs operated in Montana by private occupational schools.	Computer tapes will be available from NCES in late summer or early fall.
Department of Social and Rehabilitation Services, Rehabilitation Services Division--Vocational Rehabilitation MIS	This system provides enrollment and placement information on vocational rehabilitation clients.	State level information is available.

Organizational Responsibility And Data Source/Program	Information Use And Limitations	Information Availability
Department of Labor and Industry, Employment and Training Division --CETA MIS	Montana has two prime sponsors, Balance of State (BOS) Montana and the CEP area. Most of the training of CEP clients is done through the BOS. The client tracking system used by BOS Montana utilizes Social Security numbers and Mark IV programming to offer one of the most flexible systems of its kind in the country. Special reports on clients served, programs, and summaries by region can be provided. Plans for relating CETA client data to Employment Service employment files may provide a simple method of following up program completers.	Data on those CETA clients participating in skill training, OJT and PSE, are available by 9-digit DOT through the BOS client tracking system. This includes both CEP and CETA clients.
Department of Labor and Industry, Montana Apprenticeship Bureau--SNAPS	SNAPS collects detailed enrollment and completions information for all registered apprenticeship programs by DOT Code. The information is available at the sub-State level. In Montana, registered apprecenticeships are monitored by the State Department of Labor and Industry's Montana Apprenticeship Bureau.	Present manual processing in Montana does not produce apprenticeship data grouped by occupation.
Employment and Training Administration, U.S. Department of Labor--Job Corps	Each Job Corps Center submits an annual report to the national office that lists the enrollments and completions in Job Corps cluster courses by DOT code. There are three Job Corps Centers in Montana. Since the centers are assigned participants from anywhere in the nation, there is little assurance that participants graduating from these centers represent a true supply of trained workers in the Montana labor market.	This is a manual reporting system. Information should be available from each Job Corps Center or the regional office of the U.S. Department of Labor

Organizational Responsibility And Data Source/Program	Information Use And Limitations	Information Availability
Employment and Training Administration, U.S. Department of Labor--Job Corps (Cont.)	Job Corps also has an automated system that reports on the follow-up status of leavers from Job Corps. The report shows the labor market entered, the DOT code of the Corpsmembers job, and if the job matched the training. Not all corpsmembers are located and the report is several months old when produced.	
Department of Labor and Industry Employment Security Division--ESARS Table 96	ESARS Table 96 provides cumulative counts of Job Service local office applicants by 3- and 9-digit DOT codes. The information may be misleading in some occupations where jobs are typically temporary. A single applicant may apply many times during the year. Job Service applicants represent only a portion of those individuals seeking employment.	The ESARS Tables are produced on printouts in Montana.
Department of Labor and Industry, Employment Security Division--ES-203	The ES-203 report contains the detailed characteristics of the insured unemployed in the State. Previous occupational attachment data are available at the two-digit DOT code level of detail.	ES-203 reports are produced on printouts in Montana.
Department of Defense--DD Form 214	All military discharges are recorded on a DD Form 214. The form indicates the military occupational specialty and probable labor market. Copies of the form are distributed to the appropriate military service, State Veterans' Affairs Office, Veterans Administration, and the Employment Security Division for Unemployment Insurance Claims.	The Department of Defense is currently working with NOICC to make data on military discharges routinely available to SOICCs.

EXHIBIT 2-7
DUPLICATE COUNTS IN
SUPPLY DATA

Discussion: Exhibit 2-6 describes ten different sources of occupational supply data in Montana. Each of these sources collect administrative data that can be used as possible measures of supply. Problems of duplication occur when the same individual is counted more than once. This may occur in the following situations:

- Duplication within a sources--e.g., class-based secondary VEDS data may count the same student in two different programs if that student took courses from different programs during the same term or year.

- Duplication between sources--e.g., an unemployed person may be a CETA client and an ESARS job applicant

Recommendations:

- The responsibility for avoiding duplication within a data source should be with the producing agency. See Chapter 5 for further discussion of agency roles.

- Procedures should be developed to minimize or eliminate duplication in the supply counts between data sources prior to using the data in an OIS. This is an area of data improvement discussed in Chapter 5.

  Note: The client tracking features of the Employment and Training Division's CETA MIS and related "super-file" may provide a structure for matching records across reporting systems. Discussions have been held among Montana SOICC agencies concerning this feature. If vocational education and vocational rehabilitation data can be related to this record-matching process, duplicate counts can be identified across systems.

EXHIBIT 2-8
OCCUPATIONAL MOBILITY,
GEOGRAPHIC MIGRATION, AND
TURNOVER BY OCCUPATION

Discussion: Data on occupational mobility, geographic migration, and turnover by occupation are conceptually important for an OIS. These factors may have a significant impact on occupational supply and demand. The problem in incorporating these factors in an OIS is the lack of available data. There are no ongoing systems in Montana or in any other State that provide adequate data on these issues. One time studies are possible, but are expensive and quickly outdated. An indication of the volume of labor turnover may be obtainable from data to be available through the Employment Security Division's proposed Employer Information System. However, data on specific occupations would not be reliable.

Recommendations: Given the lack of reliable data in this area, several recommendations follow.

- Examine and synthesize available sources of information such as the BLS survey program,--that measure turnover by industry (but not by occupation).
- Monitor developments in other States.
- Incorporate expert opinion on the impact of these factors into analysis of occupational supply/demand.

The Montana SOICC staff and the Employment Security Division's Research and Analysis Section should monitor development in this this area.

(3) Occupational Characteristics Component

Conceptual Introduction: This component of an OIS contains information about the worker and the work performed in an occupation. This information can be organized into the following major sections:

- Definition and Duties
- Working Conditions
- Personal Requirements
- Training and Legal Requirements
- Methods of Entry and Advancement
- Earnings
- Occupational Employment and Outlook
- Sources for More Information

Purpose of the Component in the Montana OIS: Occupational characteristics information is important to the two major user groups of an OIS: program administrators and planners, and individuals in the process of career exploration and decision making. These users receive the information in one of the following forms:

- Occupational Supply/Demand Analysis--one purpose of an OIS is to provide supply/demand data for program planners and administrators. Occupational characteristics provide information that can be used to analyze, interpret, and explain the supply/demand relationships. This process is described in the occupational supply/demand analysis in Chapter 3.

- Career Information Delivery System (CIDS)--Occupational characteristics provide the basis of the occupational descriptions in CIDS systems. Montana has two CIDS-related systems: Montana VIEW and Montana Learning Services Career Information System. See Exhibit 2-10 for a further discussion of CIDS in Montana.

Sources of Information for this Component in Montana: A variety of local State and Federal sources contain occupational characteristics information. Montana Occupational Information Sources, prepared as part of this OIS feasibility study, includes 50 data sources grouped in the following four categories:

- Montana Agency Publications
- Montana Programs
- Montana Reporting Systems
- Federal Agency Publications

Exhibit 2-9 presents a summary of which data sources contain information on each characteristics.

Availability and Limitations of Information: The Montana Occupational Information Sources describes each source presented in Exhibit 2-9

Issues in the Development of this Data Component: The major issue in this area is the organization and delivery of characteristics information in a CIDS program. See Exhibit 2-10 for a discussion.

MONTANA CAREER INFORMATION SOURCES

EXHIBIT 2-9(1)

Table 1--Montana Agency Publications

Data Sources \ Topics	Definition and Duties	Working Conditions	Personal Requirements	Training and Legal Requirements	Methods of Entry and Advancement	Earnings	Occupational Employment and Outlook	Sources for more Information
Montana Agency Publications								
Annual Implementation Plan: Montana Health Systems Agency							•	•
Annual Report of the Services Committee to the Governor of Montana				•				•
CETA Participant Handbook			•	•				•
Comprehensive Employment and Training Plan for Balance-of-State Montana								•
Getting Hired: A Job-Hunting Manual for Montana Women					•			
Health Data Book				•		•		•
Health Ssystems Plan for Montana				•			•	
Montana Directory of Trade, Technical and Selected Professional Associations								•
Montana Education Directory				•				
Montana Guide to Post High School Opportunities				•	•			
Montana Industry/Occupation Projections--1985							•	
Montana Inventory of Occupational Information Sources								•
Montana State Plan for Vocational Education 1978-82				•				
Montana Woman: Your Job Rights					•			
Program and Financial Plan for Vocational Rehabilitation Agencies								•
Report of the Assessment of Career Education in the State of Montana								•
Selected Wage Information Montana and 14 Labor Market Areas--1980						•		
State and County Profiles							•	
Vocational Education Accountability Report						•		•
Vocational Rehabilitation State Plan								•
Youth in Montana Labor Force				•				

MONTANA CAREER INFORMATION SOURCES

Table 2--Montana Programs and Reporting Systems

Data Sources \ Topics	Definitions and Duties	Working Conditions	Personal Requirements	Training and Legal Requirements	Methods of Entry and Advancement	Earnings	Occupational Employment and Outlook	Sources for more Information
Montana Programs								
Career Information System	•	•	•	•	•	•		•
Governor's Employment and Training Council				•				•
Montana State Advisory Council for Vocational Education				•		•		•
Montana SOICC	•	•	•	•	•	•	•	•
Montana VIEW	•	•	•	•	•	•		
Old West Region Commission								•
Private Industry Council of Montana					•			•
Montana Reporting Systems								
Apprenticeship Program				•			•	•
CETA MIS				•				•
ESARS System				•			•	•
HEGIS Program				•				•
LMI Program			•	•	•	•	•	•
OES Program							•	
VLDS System				•				•
Vocational Rehabilitation								•

MONTANA CAREER INFORMATION SOURCES

Table 3--Federal Agency Publications

Data Sources \ Topics	Definitions and Duties	Working Conditions	Personal Requirements	Training and Legal Requirements	Methods of Entry and Advancement	Earnings	Occupational Employment and Outlook	Sources for more Information
Federal Agencies Publications								
BLS Wage Surveys						•		
DOT	•	•						
DOT Master Data Set		•	•	•				
BLS Directory of National Unions and Employee Associations					•		•	
Exploring Careers	•	•	•		•			
Guide for Occupational Exploration	•		•	•				
Health Careers Guidebook	•	•	•	•	•	•		
Military Civilian Sourcebook					•			
Occupational Information System Handbook	•	•	•	•	•	•	•	•
Occupational Outlook Handbook	•	•	•	•	•	•	•	•
Vocational Preparation and Occupations				•				

EXHIBIT 2-10
CAREER INFORMATION DELIVERY SYSTEM
(CIDS) DEVELOPMENT

Discussion:

Career Information Delivery Systems (CIDS) are systems designed to deliver descriptive information about occupations to individuals in the process of career exploration and decision making. Montana has two such systems.

- Montana Vital Information on Education and Work (VIEW)--This program is operated by the Office of Public Instruction and delivers 350 occupational descriptions on microfilm and printed versions. The Montana SOICC has assisted in the distribution of these materials. Both versions are available, at no cost, to all public high schools.

- Career Information System (CIS)--The Montana Learning Services of the Commissioner of Higher Education operates the CIS program in Montana. This program contains description of occupations, educational programs and schools. The information can be accessed by occupation or program title as well as through a self-assessment process that presents occupational titles consistent with personal preferences. The CIS system is currently being piloted at selected sites. The Montana SOICC has recently applied for federal funds to expand the CIS State-wide and to users in different agencies.

Recommendations:

Montana VIEW and CIS programs are important delivery/dissemination vehicles for occupational information in the State. As such, it is important that these systems contain the best available information. It is also important that users receive consistent information from these two programs and that this information be consistent with the OIS information base. Based on these requirements, the following CIDS recommendations are made. The recommended agency roles in this area are presented in Chapter 5.

- The information development process for the Montana VIEW and CIS programs should be linked and, over time, combined to ensure that Montana users receive consistent information regardless of which delivery system they access.

- The occupational characteristics component of the OIS information base should be developed in conjunction with the structure and sources in the CIS and Montana VIEW programs.

(4) Complementary Information Component

Conceptual Introduction: The complementary information component contains information that is not occupation-specific but that is necessary to support the use and analysis of occupation-specific information. There are three general categories of complementary information available to the State of Montana:

- Education and Training Auxiliary Information which includes descriptions of how nonoccupational information about education and training institutions and programs can be used for planning career guidance and job search information. This information is closely associated with Career Information Delivery Systems (CIDS) which reinforces the need for a close interface between the OIS and CIDS.

- Demographic and Economic Conditions provide the setting for realizing a complete analysis of occupational supply and demand. As with other special areas of study, occupational information is best understood within the full context of the trends of the labor force, employment, unemployment, and within the general demographic composition of the population. (The Appendix contains a sample of this information--1980 Census data for Montana.)

- Other State-Identified Information--A variety of information sources aside from those covered in the above two categories, may prove valuable in the analysis of occupational information. This category allows for including unique Montana resources.

- Purpose of the Component in the Montana OIS: Complementary information provides information that is necessary to support the use and analysis of the occupational-specific information. Education and Training Auxiliary information may assist CETA and vocational education planners to determine where and how a particular program is offered and funded. Demographic and Economic Conditions information may influence education planners to adjust training programs that train for occupations that are particularly sensitive to changes in demographic or economic conditions. Other sources of nonoccupational information may be important in the analysis and use of information about certain occupations.

- Sources of Information for This Component in Montana: Generally, the sources of complementary information in Montana are in the form of publications or routine reports from various State or local agencies or private organizations. Examples of agencies/organizations that publish this information include:

  - Department of Community Affairs
  - Department of Health and Environmental Sciences
  - Employment Security Division

- Office of Commerce and Small Business Development
- Montana Health Systems Agency, Inc.
- Montana Learning Services
- Montana Vital Information on Education and Work
- Private Industry Council of Montana, Inc.
- National Center for Career Education
- The Old West Commission

- Refer to the Montana Occupation Information Sources, an inventory of occupational publications, programs, and reporting systems, for additional sources of information.

- Availability and Limitations of Information in the Montana OIS: Complementary information is available from the source agencies and the State library system. The Montana Occupational Information Sources describes the limitations of major sources.

- Issues in the Development of this Data Component: The only issue in the development of the complementary information component of the OIS is the process through which the various publications will be organized and/or disseminated to the users of the OIS. As certain sources of complementary information prove useful in completing the understanding of certain occupational supply/demand situations, a process for including such information is an OIS should be developed. The recommended agency roles in this area are presented in Chapter 5.

CHAPTER 3--OPERATIONAL COMPONENTS OF A MONTANA OIS

The previous chapter described four data components for an OIS and the Montana information sources available for each component. The purpose of this chapter is to describe how the data sources can be related and analyzed to provide useable occupational information in Montana. The purpose is met by describing two operational components for an OIS. They include:

- Occupational Supply/Demand Interface Component--This involves relating information from the occupational demand and occupational supply data components and producing data that represent comparable classification systems, geographic areas, and time periods.

- Occupational Supply/Demand Analysis Component--This involves the interpretation, analysis, and explanation of the data produced in the interface component using occupational characteristics and complementary information as well as the supply and demand data.

Exhibit 3-1 shows which data components are used in the two operating components described in this chapter.

(1) Supply/Demand Interface Component

Conceptual Introduction: The development of occupational supply/demand information involves bringing together a number of different sources of information to represent data from occupational supply/demand relationships. To the extent that these information sources can be related, the interface must be based upon a consistent rationale for four basic issue areas. These issue areas are Geographic, Classification, Time Period, and Measurement.

- Geographic Interface--The various sources of occupational supply and demand information have different geographic coverage. As an example, supply information is generally provided by individual reporting institutions which must be summed to reach a state-wide aggregation, whereas employment data is provided by SMSA or state-wide area. The supply/demand data must be organized so that similar areas are covered.

- Classification Interface--The sources of occupational information use different classification systems to describe the occupations and training programs. The crosswalk between these classification systems is being developed as a part of the cluster project described in Chapter 1. The rationale for relating the supply and demand information organized by the various classification systems in Montana has been focused through the unit of analysis called a "cluster." The final cluster report will provide the basis for the classification interface.

- Time Period Interface--The various sources of information do not have uniform time period coverages. The sources may cover different periods of the year, e.g., school year, fiscal year, etc., or may have different time publication frequency--weekly, monthly, quarterly, annually, biennually, etc. Time period interface must be addressed to ensure supply/demand data comparability.

- Measurement Interface--The varied data sources will have both obvious and subtle differences in how they measure occupational supply and demand. In training programs, enrollment, completion, and placement data represent alternative measures of supply. For an OIS, the similar measures from each source used must be established.

Purpose of the Component in the Montana OIS: This component provides the logic for the supply/demand relationship in the OIS. This component provides the structure and procedures for organizing and processing the supply and demand data. In an automated environment, this component is manifested in the form of computer programs that receive, store, process, and produce occupational supply/demand reports.

Chapter 4 describes three OIS design alternatives and how this component would be addressed in each alternative.

(2) Supply/Demand Analysis Component

Conceptual Introduction: The analysis of supply/demand information is potentially the most difficult and extensive component of the OIS. This component will analyze occupational supply and demand information from several points of view.

- Quantitative Analysis of the Supply/Demand Interface--Various ranking or comparisons between occupational clusters, occupations, and/or training programs may prove useful in analyzing the relative importance or relevance of particular occupational information

- Technical Parameters of Supply/Demand Interface--The supply/demand interface will include or exclude certain data due to a variety of processing, interface and other issues. These technical parameters need to be provided to present the full supply/demand picture.

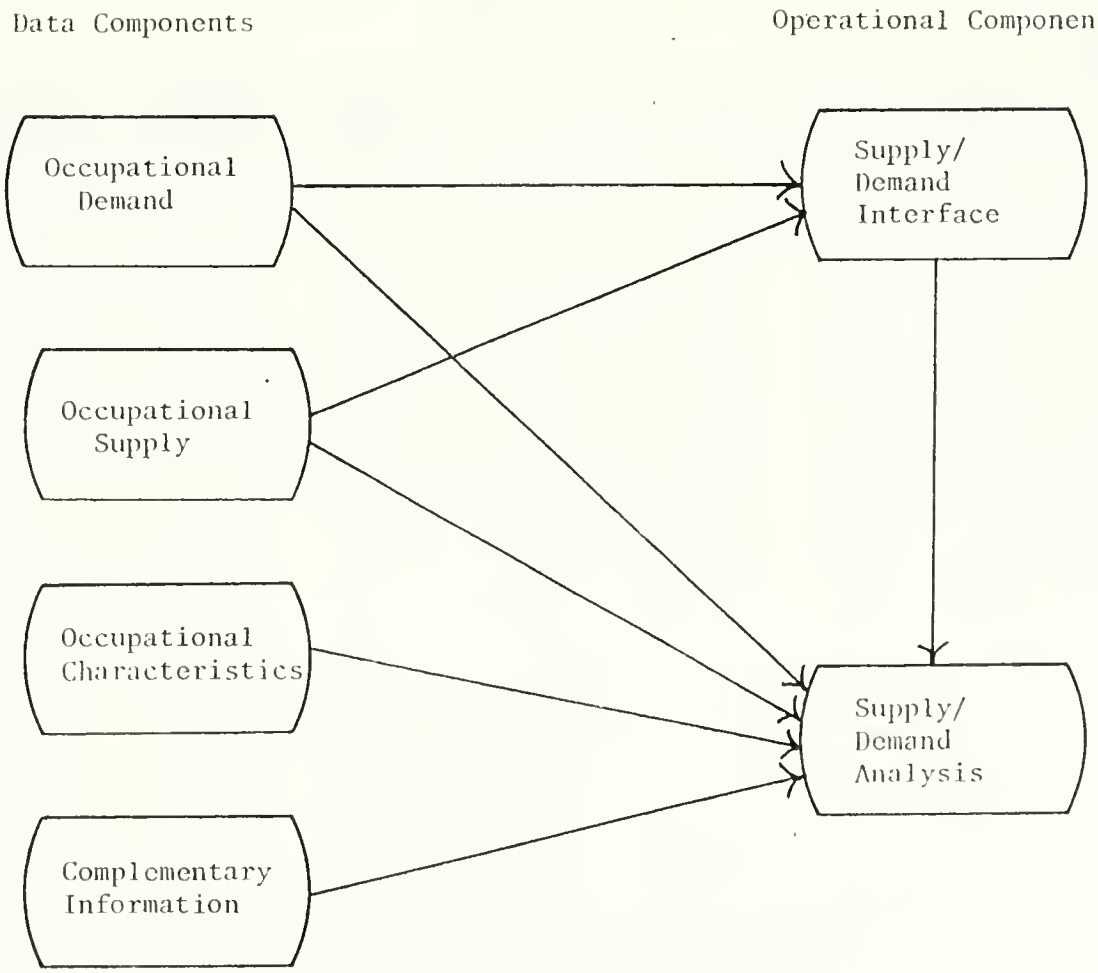
- Qualitative Analysis of Supply/Demand Information--The qualitative analysis of the supply/demand interface, and the results of technical and quantitative analysis, combined with various occupational characteristic and complementary information will serve to determine the reasons for supply/demand situations. The qualitative analysis will offer perspectives on contradictory supply/demand information and provide the qualifying links between various occupational information components.

- Analysis Using Other Quantitative Supply/Demand Indicators--Certain information that cannot be processed directly through the supply/demand interface may contain quantitative data that could be analyzed from a quantitative perspective. Such quantitative analysis may include supplemental supply/demand data or proxies such as analysis of ESARS occupational data, additional sources of employment data, comparisons of SVP and GED from related Dictionary of Occupational Titles codes/titles.

Purpose of the Component in the Montana OIS: This component of the OIS has two important functions. First, it provides a means to integrate characteristic information into the OIS that is not processed through the supply/demand interface component. Second, the analysis component provides the capability to analyze, interpret, and explain the supply/demand relationships. This analysis is a critical feature for ensuring that the OIS will serve to support the decisionmaking process of vocational education planners, career decisionmakers, and others.

The OIS design alternatives described in Chapter 4 indicate several possible activities and products of the supply/demand analysis components.

EXHIBIT 3-1
RELATIONSHIP BETWEEN
OIS COMPONENTS



CHAPTER 4--OIS DESIGN ALTERNATIVES: PROCEDURES, SCHEDULES, AND COSTS

Chapter 3 presented the two operational components of an OIS:

- Occupational Supply/Demand Interface
- Occupational Supply/Demand Analysis

These components may be conducted at one of several different levels in Montana, depending on the computer facilities, financial resources, and preferences of Montana agencies. This chapter will describe three alternative designs for Montana's OIS. It should be noted that recommended agency roles associated with these three design levels are not presented in this chapter, but rather are presented in Chapter 5. The alternatives are briefly described below:

- Level I--Manual Procedures--This process involves extracting appropriate supply/demand data from Montana sources, interfacing these data using the Montana clusters, and analyzing and reporting the results. All these activities would be done manually.

- Level II--Automated Procedures--This process is similar to Level I except the interfacing, analysis, and report preparation is computer-processed.

- Level III--Automated Procedures--This process is similar to Level II except data entry is automated (to the extent possible) and additional computer analysis and reporting is possible.

Prior to analyzing each of these alternatives in detail, it is necessary to consider the major functional steps that are to be completed in the OIS operational component. These steps involve processing demand data, interfacing the supply and demand data, and generating reports from the interface. These steps must be taken regardless of the alternative level selected. The steps are described below:

- Demand Data Processing--Long-term employment projections from the Employment Security Division will be organized by geographic area and by Census-based industry-occupation matrix codes in a table or file.

- Supply Data Processing--Enrollments, leavers, and completers data from a variety of education/training information sources will be obtained and organized by source, geographic area, training program discipline code, and level of instruction. These data will be stored in tabular format in a table or file.

- Classification Interface--The classification interface is obtained through the development of Montana Occupational/Training Clusters. The clusters serve as the table or file that defines how, where, and to what extent the supply and demand data will be interfaced.

- Report Generation--This is a process for generating supply/demand interface reports by relating the products of the preceeding three steps.

OIS Design Alternatives

The three alternatives presented in this feasibility study are identical in function (that is, they involve completing the same four steps), only the level or degree of automation distinguishes them. Each of these alternatives will be described in detail. Exhibit 4-1 on the following page lists the OIS technical steps and their relationship to the three design alternatives which follow.

- Level I Manual OIS Design--Exhibit 4-2. This processing diagram is a graphic presentation of the manual procedures. The Level I alternative is the most feasible alternative under conditions where there is only a single geographic coverage area to consider, few occupational/training clusters (40-60), and annual production of the supply/demand interface. The manual procedures are transferrable to automated procedures. Manual procedures may also be adopted to supplement automated procedures in certain one-of-a-kind requests for supply/demand interface reports. If incremental development of automated procedures starting from the Level I alternative is the chosen design strategy of the Montana SOICC, it should follow this sequence: Classification Interface, Demand Data Processing, Supply Data Processing, Report Generation.

- Level II Automated OIS Design--Exhibit 4-3. This is a graphic presentation of the Level II Automated Procedures. To the maximum extent possible, this alternative should be developed using parameter or table-driven software and report generation packages such as the MARK IV File Management System. Such software packages offer comparatively easy development, implementation, maintenance, and documentation of information systems for non-technical data processing users. These packages can also reduce the development cost of the information system if the user requirements remain within the parameters of the file management and report generation features. This alternative is specifically tailored to remain within the parameters typically found in these software packages. All data are keypunched for data entry, which may be a large task; however, this eliminates the cost and inherent complexities of direct interface with other data processing systems. All reports use standard report generation features.

- Level III Automated OIS Design--Exhibit 4-4. This is a graphic presentation of the Level III Automated Procedures. This alternative consists of enhancements to the Level II Automated OIS Design. No enhancements are offered for the Demand Data Processing and Classification Interface functions. To the extent that is feasible and cost-effective, certain supply data could be entered with automated input transactions. The automated entry of such data requires detailed knowledge of the source data system and a relatively higher level of data processing expertise than is found in the Level II alternative. The adoption of automated input transactions increases the

potential for using national data source systems such as HEGIS and the NCES Postsecondary Career School Survey. These contain information on education/training providers outside the State of Montana who may educate/train a significant number of Montana residents. This alternative also allows for the production of additional reports that may prove useful to certain users. Examples include Supply/Demand Interface Ranking Reports that may be used in the Supply/Demand Analysis Component of the OIS, or Supply/Demand Interface Reports that include out-of-State data. Also possible are Special Supply Reports derived from the Supply File. Certain users may desire information on training providers and/or programs in their local area. If incremental development of Level III Automated OIS Design from Level II is chosen as the development strategy by the Montana SOICC, it should follow this sequence: Special Supply Reports, Ranking Reports (if they are within the processing parameters of the report generation package), and automated input transactions for selected source data systems.

OIS Design Work Schedules

The work necessary to develop and implement each succeeding OIS alternative design level becomes increasingly complex. Exhibits 4-5, 4-6, and 4-7, present the work that must be performed to develop and implement each of the three design alternatives. In addition, time schedule estimates are presented for each work element. A common twelve-month development cycle was used to facilitate comparisons. It should be noted, however, that at Level I a twelve-month development time might be considered generous, whereas, at Level III twelve months may be minimal.

OIS Design Cost Estimates

Exhibit 4-8 presents a Cost Estimate Summary for the one-time development and annual operating costs of the three alternative design levels. Exhibit 4-9 desribes the one-time development costs at detailed levels for Procedures Deveopment and ADP Machine Time and Services. Exhibit 4-10 provides a detailed description of the personnel resources (staffing) and ADP Machine Time and Services necessary to operate each of the three OIS alternative design levels. In both these exhibits, the computer costs do not reflect the cost of the submitting agency to format the data for OIS entry and processing. These are conservative cost estimates and should be used for comparison among the three levels. Actual costs will differ depending upon funding, implementation, and staffing decisions. The documentation of the cost and salary data is presented in the Appendix to this report.

EXHIBIT 4-1
TECHNICAL STEPS IN OIS OPERATION

	OIS Design Alternative Levels		
	I	II	III
Demand Data Processing			
Manual Data File (Table)	X		
Automated Data File		X	X
Keypunch Data Entry		X	X
Automated Demand File Detail Report		X	X
Automated Error Report		X	X
Supply Data Processing			
Manual Data File (Table)	X		
Automated Data File		X	X
Keypunch Data Entry		X	X
Automated Data Entry of Some Data Sources			X
Automated Supply File Detail Report		X	X
Special Supply Reports (TBD)			X
Automated Error Report		X	X
Classification Interface			
Manual Cluster Tables	X		
Automated Cluster File		X	X
Keypunch Data Entry		X	X
Automated Cluster Report		X	X
Automated Discipline Report		X	X
Automated Error Report		X	X
Report Generation			
State-wide Reports	X	X	X
Sub-state Reports		X	X
Automated Error Reports		X	X
Automated Ranking Reports			X
Multi-State Reports			X

EXHIBIT 4-2
LEVEL I MANUAL PROCEDURES

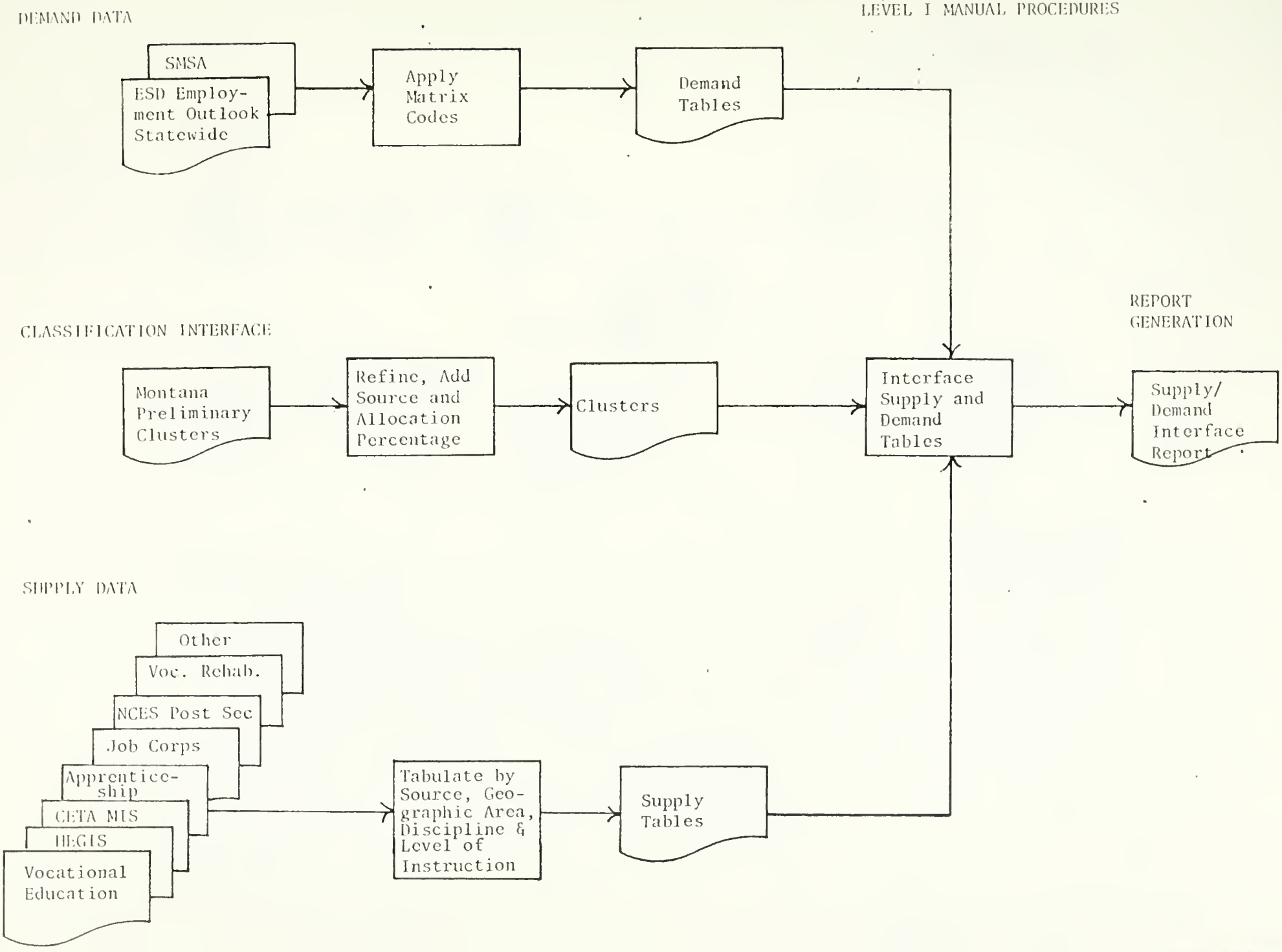


EXHIBIT 4-3
LEVEL II AUTOMATED PROCESS

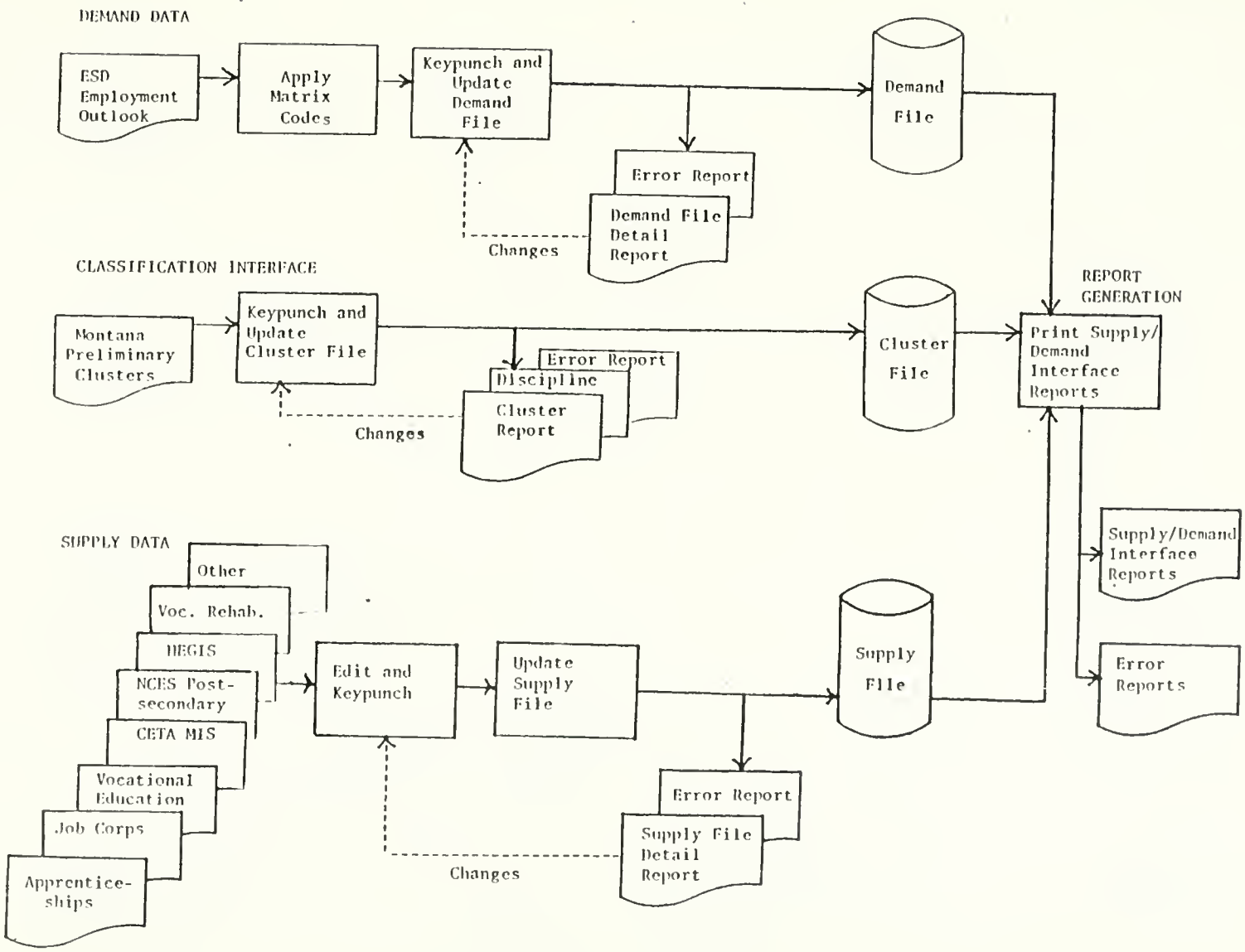


EXHIBIT 4-4
LEVEL III AUTOMATED PROCESS

LEVEL III AUTOMATED PROCEDURES

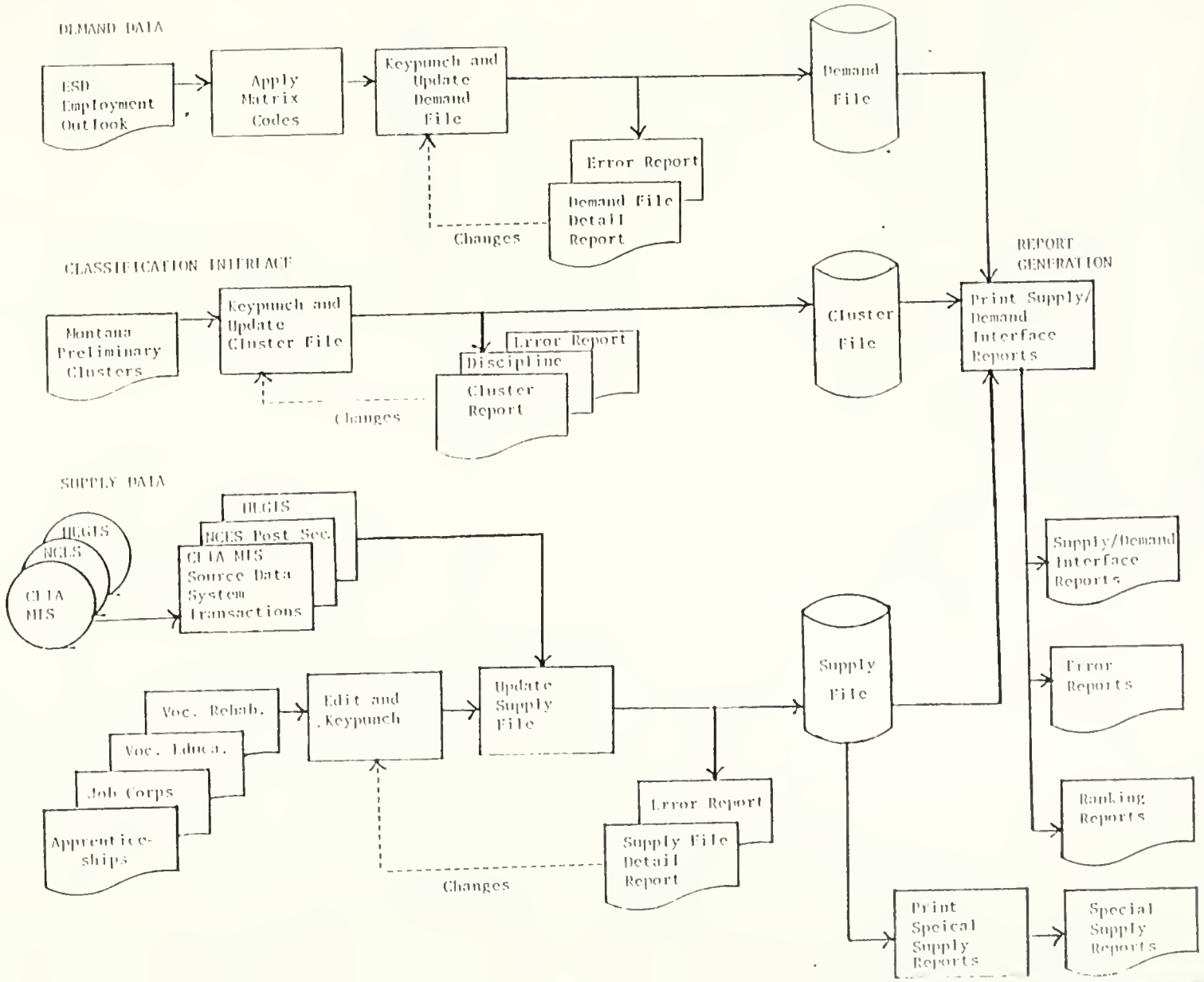
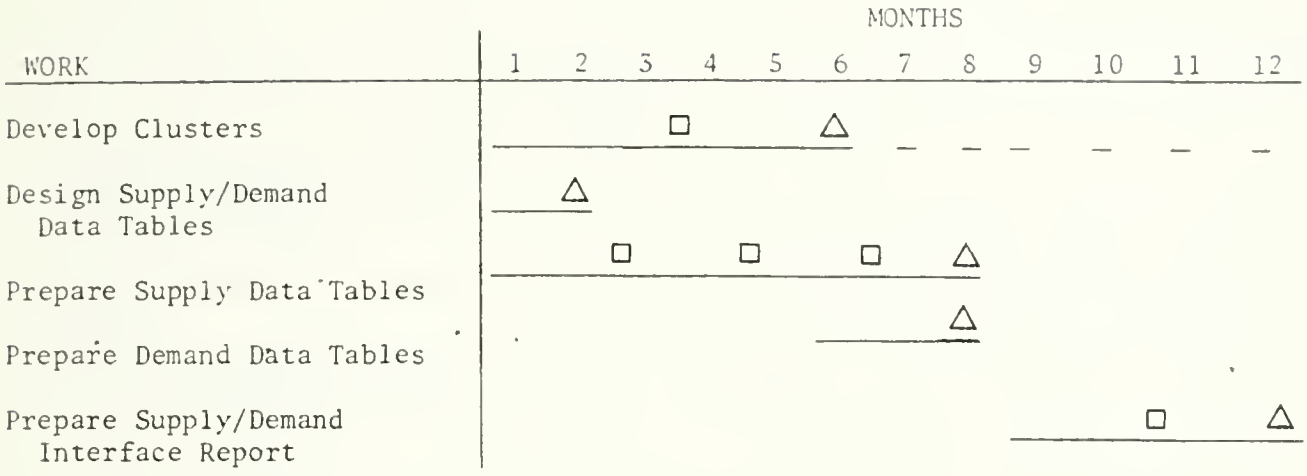


EXHIBIT 4-5

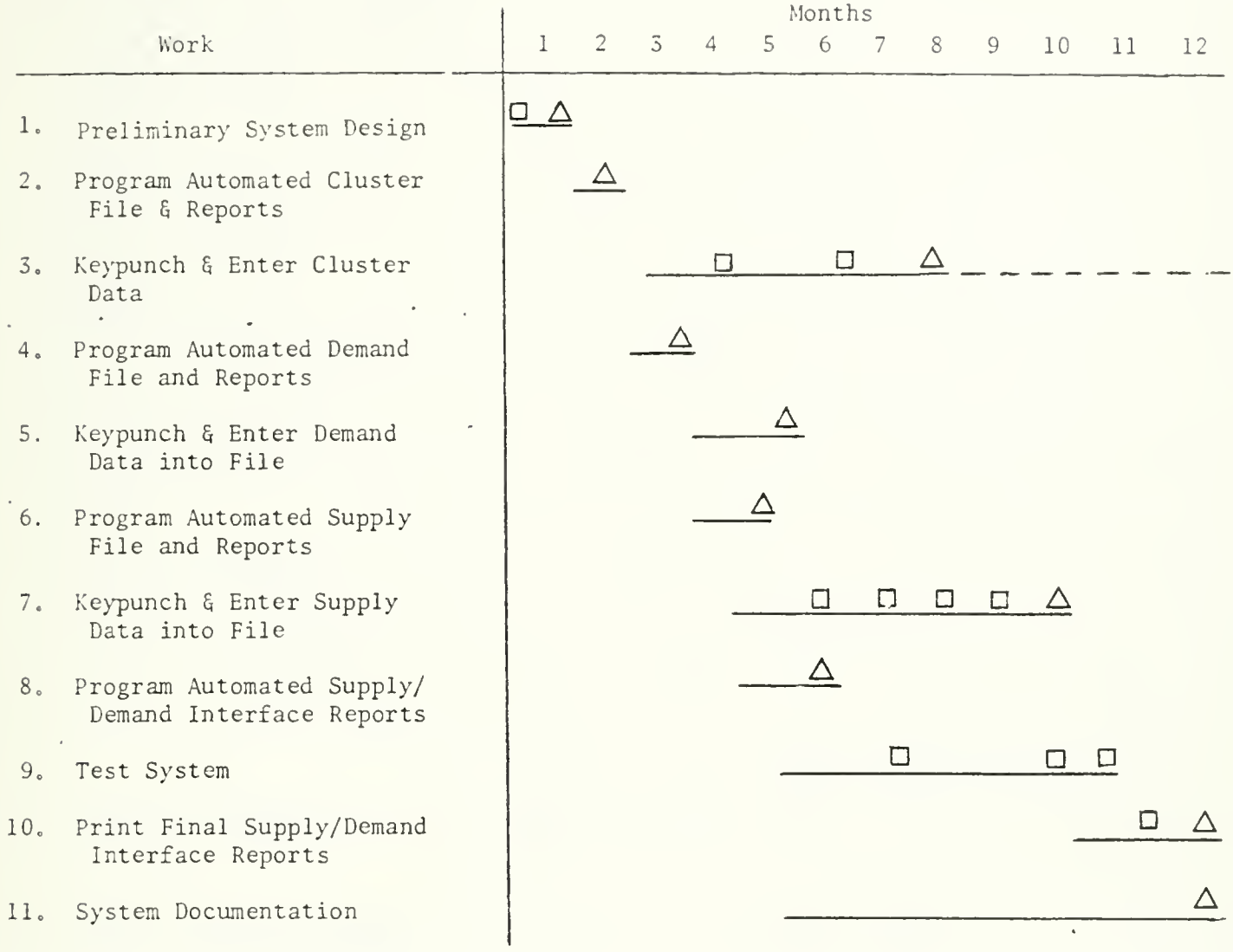
SCHEDULE LEVEL I MANUAL PROCEDURES



Footnote: □ - Preliminary Report/Product
△ - Final Report/Product

EXHIBIT 4-6

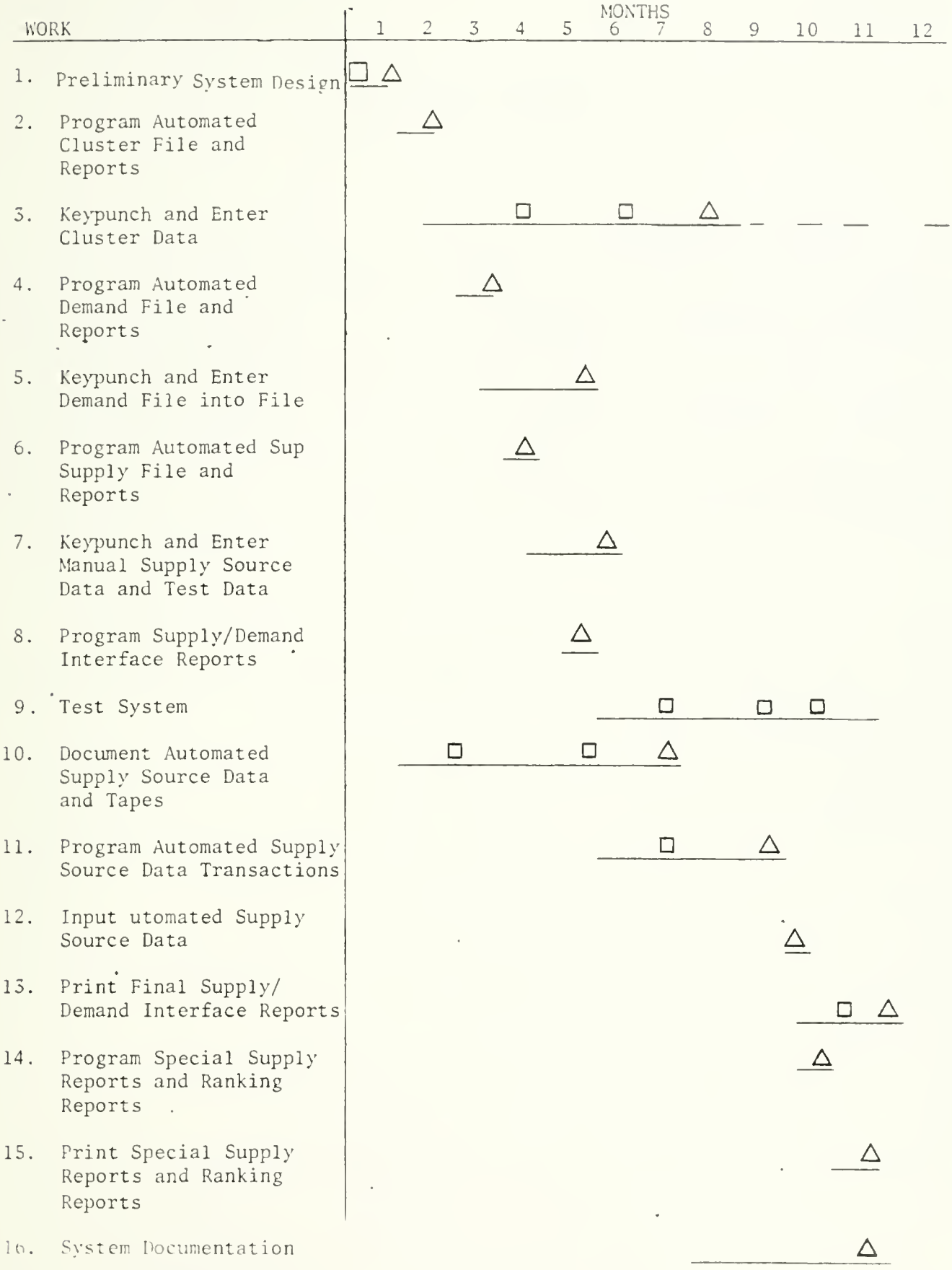
SCHEDULE LEVEL II AUTOMATED PROCEDURES



Note: □ Preliminary Product
△ Final Product

EXHIBIT 4-7

SCHEDULE LEVEL III AUTOMATED PROCEDURES



Note: □ Preliminary Product
△ Final Product

EXHIBIT 4-8

COST ESTIMATE SUMMARY

OIS DESIGN ALTERNATIVES

	I	II	III
One-Time Development Cost	$10,000	$25,000	$ 35,000
Annual Operating Costs	$30,000	$50,200	$ 70,600
TOTAL	$40,000	$75,200	$105,600

Note: Detailed Cost Estimates are presented on the following tables.

EXHIBIT 4-9

DETAILED ONE-TIME OIS DEVELOPMENT
COST ESTIMATES *

	OIS DESIGN ALTERNATIVES		
	I	II	III
Procedures Development			
. Classification, Time-Period, Geographic and Measurement Interface Development	$ 5,000	$ 5,000	$ 5,000
. System Design and Analysis	5,000	16,000	25,000
SUBTOTAL	$10,000	$21,000	$30,000
ADP Machine and Service Costs			
. Computer Time & Test Runs	-0-	3,000	4,000
. Keypunch Services	-0-	1,000	1,000
SUBTOTAL	-0-	4,000	5,000
TOTAL ONE-TIME DEVELOPMENT COSTS	$10,000	$25,000	$35,000

*See the Appendix for Documentation of Cost Information

EXHIBIT 4-10

DETAILED ANNUAL OIS OPERATING
COST ESTIMATES *

	OIS DESIGN ALTERNATIVES		
	I	II	III
Personnel Salaries - (Direct)			
Programmer-operator	-0-	$20,000	$20,000
OIS Analyst	$18,000	18,000	18,000
OIS Analyst	-0-	-0-	20,000
Clerk-Typist	10,000	10,000	10,000
SUBTOTAL	$28,000	$48,000	$68,000
ADP Operating Costs			
Keypunch Services	-0-	$ 1,200	$ 600
System Maintenance	-0-	800	1,400
Full Production Run	-0-	200 (1 run)	600 (2 runs)
SUBTOTAL	-0-	$ 2,200	$ 2,600
TOTAL ANNUAL COST	$28,000	$50,200	$70,600

*See the Appendix for Documentation of Cost Information

CHAPTER 5--ISSUES AND RECOMMENDATIONS

This chapter describes the major OIS implementation issues facing the Montana SOICC and provides recommendations on how the most significant of these issues can and should be resolved. The recommendations in this chapter are based on the data sources and OIS design options described in Chapters 1-4. The recommendations are the result of Program Resources, Inc. staff analysis and do not represent Montana SOICC policy. The recommendations are presented in two parts: those dealing with technical issues and those dealing with implementation issues. These issue areas are briefly defined below and detailed on the following pages.

- Technical Issues--Those dealing with the data sources and the relationship between the four OIS data components and two OIS operational components (See Exhibit 3-1). The discussion of the data components includes related agency roles and responsibilities.

- Implementation Issues--Those dealing with an overall OIS design and appropriate agency roles to support this design.

The chapter concludes with recommendations for operating roles for the Montana SOICC.

Technical Issues

The discussion of technical recommendations is organized by OIS component in the order each was presented and described in Chapters 2 and 3. The first four components listed below are the data components described in Chapter 2. For each component, recommendations and agency roles are presented under two headings: "immediate implementation" and "future data developments". The fifth and sixth components below are the operating components described in Chapter 3.

(1) Occupational Demand Component--The issue in demand is which data source should represent this component.

- Immediate Implementation

  - It is recommended that the Census-based matrix system be used as a source of current and projected occupational employment data.

    Responsible Agency--The Research and Analysis Section of the Employment Security Division is responsible for producing current and projected occupational employment data using the Census-based matrix system.

. Future Data Improvement

- For future OIS planning and development, it is recommended that the OES Survey-based system be substituted for the Census-based data when OES data become available.

  Responsible Agency--The Research and Analysis Section is responsible for collecting OES Survey data and producing current and projected occupational employment data from the survey.

(2) Occupational Supply Component--The issue in supply is what type of data should represent this component.

. Immediate Implementation

- It is recommended that data on completers of Montana education and training programs be used as the information to represent this component.

  Responsible Agencies--The following agencies are responsible for data collection on education and training programs in Montana:

  .. Office of the Commissioner of Higher Education (Higher Education General Information Survey - HEGIS)

  .. National Center for Education Statistics (Postsecondary Career School Survey)

  .. Office of Public Instruction (Vocational Education Data System)

  .. Rehabilitation Services Division (Vocational Rehabilitation MIS)

  ... Employment and Training Division (CETA MIS)

  .. Montana Apprenticeship Bureau (State and National Apprenticeship Systems - SNAPS)

  .. Job Corps Regional Office

- It is recommended that information on occupational mobility, geographic migration, occupational turnover, and projected occupational supply should not be included in the Montana OIS until more reliable data are available.

- It is recommended that duplication of supply data should be avoided both within a given source and between different sources of supply data.

Responsible Agencies--Each source agency should be responsible for preparing completions data on their programs that is unduplicated. The SOICC staff should be responsible for developing and implementing procedures to eliminate overlapping supply counts between data sources. The SOICC TSC should be responsible for approving the proposed procedures and assisting in their implementation.

- Future Data Improvements

  - It is recommended that procedures be developed to collect information on the post-graduate experience of program completers. This may involve either placement or follow-up information.

    Responsible Agencies--The SOICC staff should be responsible for developing and assisting in implementing procedures to collect this information across data sources. The SOICC TSC should be responsible for approving the proposed procedures and the implementation of these procedures in their agencies.

(3) Occupational Characteristics/Complementary Information Components

- Immediate Implementation

  - It is recommended that the information development process of the Montana VIEW and CIS programs be related to ensure Montana users consistent career information.

    Responsible Agencies--The SOICC staff should prepare a position paper on the role of and relationship between the VIEW program and CIS program. The paper should identify options for immediate and future information integration of these programs. The SOICC TSC, with the advice of representatives of both programs, should review the position paper and recommend changes prior to its submission to the SOICC committee for a policy determination.

    NOTE: The administrative structure of the pending NOICC CIDS grant will provide an advisory board that should also participate in the review process.

- Future Data Improvements

  - The preceding discussion relates to both immediate and future activities in this area.

(4) Supply/Demand Interface Component--The purpose of the OIS supply/demand interface is to relate data from different sources. This involves resolving differences between data sources in four issue areas. The recommendations for each issue area are described below. It should be noted that these recommendations are based on a Level 1 - Manual OIS Design. Higher level designs would allow for finer levels of analysis (e.g., sub-State areas). The agency roles in this component are described in the next section of this chapter.

- Classification Systems--It is recommended that the Montana Occupational and Education/Training Clusters being developed be utilized as the basis of relating data reported on different classification systems.

- Geographic Coverage--It is recommended that OIS development should focus initially on providing State-level data.

- Time Period Coverage--It is recommended that OIS development should focus initially on providing current annual data.

- Measurement Issues--It is recommended that the occupational demand component be represented by data from the OES program (Census data until Survey data are available) and that the occupational supply component be represented by data on those completing education and training programs in Montana.

(5) Supply/Demand Analysis Component--This component may include quantitative analysis using occupational characteristics data or qualitative analysis using supply/demand proxy data. The issue for this component involves defining the level of analysis. The agency roles in this component are described in the next section of this Chapter.

- It is recommended that initial OIS development include an analysis of the relative size of the supply/demand numbers for each cluster as well as selected occupational characteristics. Based on available information in Montana, the following characteristics should be included:

  - Wages and earnings
  - Licensing, certification, or registration requirements
  - Education and training requirements

  This analysis should include approaches described in NOICC's Occupational Information System Handbook (Volume 2, Chapter 5).

Implementation Issues

(1) Feasibility of an OIS--Based on the needs of agency personnel and the resources and staffs of SOICC member agencies, it is feasible to develop an OIS in Montana.

(2) Disposition of Technical Issues--Prior to the selection of an OIS Design a decision needs to be made concerning the Technical Issues described in the first half of this chapter.

- It is recommended that the SOICC Technical Steering Committee review each technical recommendation and adopt as stated or prepare alternative statements and that these technical statements be submitted to the Statutory Committee as proposed features of the Montana OIS.

- It is recommended that the SOICC TSC communicate, in writing, with each affected agency. This communication should present the SOICC TSC's recommendation on the technical issues and their implications for each agency.

(3) OIS Design--Chapter four identified three alternative OIS designs. The recommended designs for the Montana OIS are listed below.

- For the first year of implementation, Montana should develop a Level I - Manual OIS system.

- For subsequent years, Montana should develop a Level II - Automated OIS system.

(4) Agency Roles--Chapter four described the functional features of each of the alternative OIS designs. It is now appropriate to look at these functions and provide recommendations as to what the role of Montana agencies should be. The recommendations are provided for each OIS design level. Within each level the following groups are described:

- SOICC TSC--The SOICC Technical Steering Committee

- SOICC Staff--The staff of the SOICC (currently three persons)

- SOICC Agencies Participating in the OIS--Montana agencies that participate in the OIS design and use and provide data input for the OIS. The following agencies would be included:

  - Employment Security Division
  - Office of the Commissioner of Higher Education
  - Employment and Training Division
  - Office of Public Instruction
  - Rehabilitation Services Division

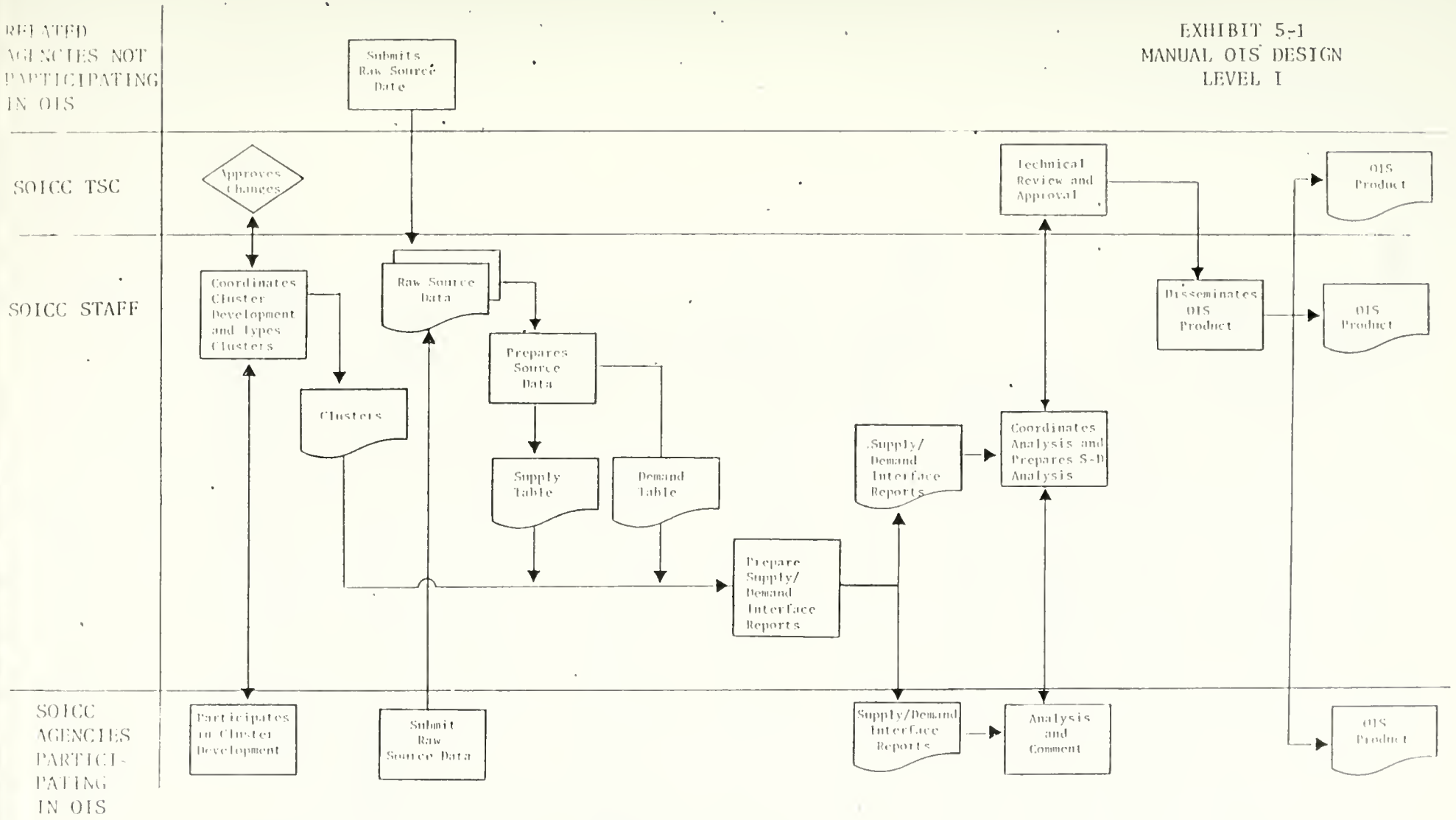
- Related Agencies Not Currently Participating in the OIS--These are agencies that produce data of value to an OIS but are not currently participating in OIS development. This may include the following agencies:

  - Montana Apprenticeship Bureau
  - National Center for Education Statistics
  - Job Corps Regional Office

- Data Processing Agent--Montana agency, university, or program that provides data processing services for OIS operation. (Level II only)

(5) Level I - Manual OIS Design--Exhibit 5-1 on the following page presents the process appropriate to the Manual OIS Design. The recommended responsibilities and role of each group are described below. It should be noted that the following responsibilities are in addition to those previously described in this Chapter.

EXHIBIT 5-1
MANUAL OIS DESIGN
LEVEL I



SOICC TSC

- Review and approve the content and coverage of the Montana clusters
- Participate in the development of the OIS design
- Participate in the development of OIS procedures, approve such procedures, and assist in their implementation.
- Review and approve the proposed OIS Supply/Demand reports to ensure the appropriateness of the following components:
  - Supply/Demand Interface--the relationships suggested between data from different sources represent comparable time periods, geographic areas, and conceptual measures
  - Supply/Demand Analysis--the interpretation and analysis proposed for the OIS product are appropriate

SOICC Staff

- Coordinate the supply/demand interface and the cluster development
- Initiate the development of OIS procedures and finalize them with SOICC TSC review
- Implement those OIS procedures that have been approved by the SOICC TSC
- Prepare source data for use in supply and demand tables
- Prepare the analysis and interpretation of supply/demand OIS products for technical review. Finalize product after review.
- Disseminate final product

SOICC Agencies Participating in the OIS

- Serve as members of the Montana Cluster Task Force
- Provide accurate source data on their programs that are unduplicated. (See Exhibit 5-2 for specific agencies.)
- Review and comment on draft copies of the OIS reports

Related Agencies Not Participating in the OIS

- Provide requested data

EXHIBIT 5-2
OIS DATA SOURCES AND
RESPONSIBLE AGENCIES

OIS COMPONENT DATA SOURCE	RESPONSIBLE AGENCY
Demand	
. Census/OES	Employment Security Division
Supply	
. Higher Education General Information Survey (HEGIS)	Office of the Commissioner of Higher Education
. NCES Postsecondary Career School Survey	National Center for Educational Statistics
. Vocational Education Data Systems (VEDS)	Office of Public Instruction
. Vocational Rehabilitation Management Information System (MIS)	Rehabilitation Services Division
. CETA Management Information System (MIS)	Employment and Training Division
. State and National Apprenticeship System (SNAPS)	Montana Apprenticeship Bureau
. Job Corps	Job Corps Regional Office
Characteristics	
. Career Information System (CIS)	Office of the Commissioner of Higher Education
. Vital Information for Educatic and Work (VIEW)	Office of Public Instruction

(6) Level II - Automated OIS Design--The OIS Design recommended for the second and subsequent years is Level II. It should be noted that the technical recommendations discussed earlier in this Chapter are based on a Level I design. The SOICC TSC and SOICC staff should systematically review each technical recommendation for appropriateness prior to initiating an automated OIS design. One feature to consider is the improved processing capability of Level II.

Exhibit 5-3 on the following page presents the process for the automated OIS design. It contains the same four groups identified in the Level I model, and also contains a "data processing agent." The roles and responsibilities of each group in the Level II design are described below.

- SOICC TSC

  - The TSC has the same review and approval responsibilities as in Level I.

- SOICC Staff

  - The SOICC staff has responsibilities similar to those in Level I with the following addition.

    .. Prepare input data from non-participating agencies in a usable format

- Data Processing Agent

  - Provides computer time and system analysis, programming and key-entry personnel needed to perform the following functions:

    .. Receive data in printed form and create an automated cluster file

    .. Receive data in printed and data tape form and create automated demand and supply files

    .. Create supply/demand interface reports using the above automated files

  - Based on processing facilities and staff capabilities, it is recommended that the Management Information System Section of the Employment and Training Division be selected as the data processing agent.

- SOICC Agencies Participating in the OIS--The agencies have roles similar to Level I except they would provide their data on a standardized, agreed-upon OIS format in Level II.

- Related Agencies not Participating in the OIS--The agencies would have the same role as in Level I.

EXHIBIT 5-3.
AUTOMATED OIS DESIGN
LEVEL II

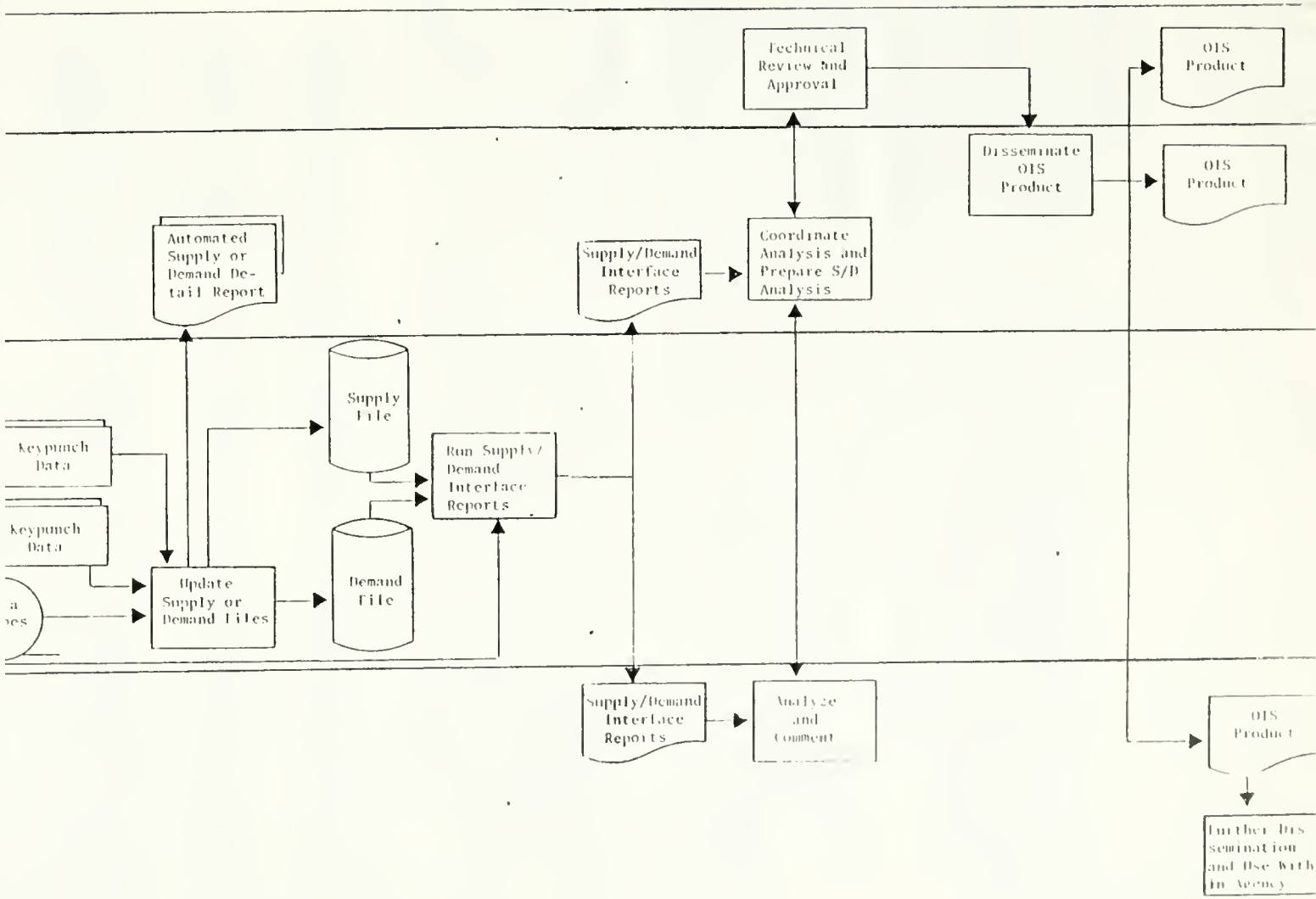
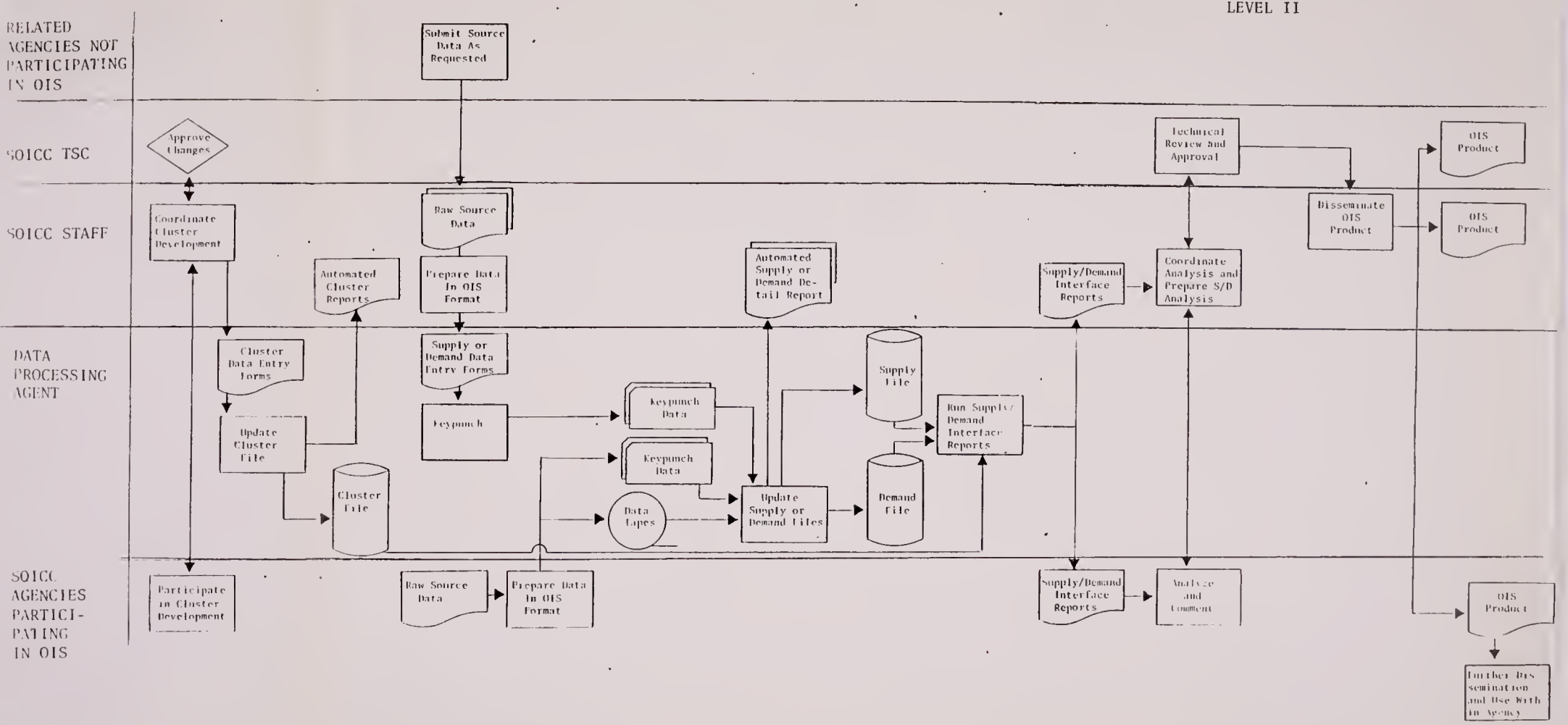


EXHIBIT 5-3
AUTOMATED OIS DESIGN
LEVEL II



Operating Roles of SOICC

This report has described a number of issues and considerations in the development of an OIS in Montana. The OIS design recommendations in this report represent a system for preparing occupational supply and demand reports. While this focus is appropriate for an OIS, it does not fully represent the operating role possible for the Montana SOICC. Based on the information assembled in preparing this final report, Program Resources proposes two additional areas appropriate for the Montana SOICC. These areas are described below:

(1) Clearinghouse Service--The Montana SOICC should assume a leadership role in satisfying the occupational information needs of Montana agency personnel. This role may be met by referring interested personnel to the appropriate agency or contact person, preparing and distributing information materials and publications (such as Montana Occupational Information Sources), or conducting training activities and workshops for information users.

(2) Data Improvement Service--This report has described a number of areas for future data improvement. The Montana SOICC should assume a leadership role in improving the quality and usefulness of occupational information in Montana. This may involve committing SOICC staff, SOICC resources and/or SOICC agency staff and resources to activities that will improve the quality of occupational data available in Montana. Of the information areas needing improvements, the following are considered the most important and thus would warrant priority consideration.

- The Montana SOICC should support the development and use of the OES Survey-based program as the source of current and projected occupational demand information.

- The Montana SOICC should support efforts to control and eliminate duplication of counts for individuals completing education and training programs.

- The Montana SOICC should support efforts to integrate the information development efforts of the Montana VIEW and CIS programs for the purpose of offering consistent, high quality career information to Montana residents.

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APPENDIX

Contents

MONTANA OCCUPATIONAL AND EDUCATIONAL/
TRAINING PROGRAM CLUSTERS

CLUSTER LIST

Agriculture Clusters

AG1 Agriculture Production Occupation
AG2 Agriculture Business Occupation
AG3 Agriculture Mechanics
AG4 Horticulture and Landscaping Occupations
AG5 Forestry Occupation

Graphic Arts Clusters

GX1 Advertising
GX2 Drafting
GX3 Commercial Art
GX4 Printing and Graphic Arts

Health Clusters

HE 1 Medical Record Technologist
HE 2 Dental Assistant
HE 3 Dental Hygienist
HE 4 Medical Laboratory Technician
HE 5 Licensed Practical Nurse
HE 6 Medical Nursing Assistant
HE 7 Treatment Services Occupations
HE 8 Radiologic Technician
HE 9 Registered Nurse
HE10 Physician

Marketing Clusters

MK1 Real Estate Marketing
MK2 Marketing Management
MK3 Retail Marketing
MK4 Recreation and Tourism

Office Clusters

OF1 Bookkeeping and Accounting
OF2 Clerical Office Practice
OF3 Communications Clerical
OF4 Personnel and Labor Relations
OF5 Secretarial Office Practice
OF6 Office Administration and Management
OF7 Keypunch Operator
OF8 Computer Science Occupations

Public Service Clusters

PS1 Emergency Medical Technician
PS2 Fire and Fire Safety
PS3 Police Science

CLUSTER LIST (continued)

Skill Clusters

SK1 Electrical Occupations
SK2 Electronic Occupations
SK3 Air Conditioning and Refrigeration
SK4 Welding Occupations
SK5 Carpentry and Construction Trades
SK6 Heavy Equipment Mechanics and Repairers
SK7 Automotive and Engine Mechanics
SK8 Machine Shop
SK9 Metalworking Occupations

Service Clusters

SV1 Institutional & Building Service Occupations
SV2 Vehicle Operators
SV3 Barbering
SV4 Cosmetology
SV5 Child Care Services
SV6 Food Production, Management & Services

Technology Clusters

TC1 Power Station Operators
TC2 Civil Technology Occupations
TC3 Chemical Technology Occupations
TC4 Environmental Control Technology Occupations
TC5 Mechanical Technology Occupations
TC6 Instrument Technology Occupations
TC7 Textile Technology Occupations
TC8 Commercial Aviation Occupations
TC9 Industrial Engineering Occupations

MONTANA OCCUPATIONAL AND EDUCATIONAL/TRAINING CLUSTERS

SAMPLE FORMAT

Cluster Name Secretary-Stenographer

Supply or Demand	Education/Training Programs or Occupations		Source Data System	Comments
	Titles	Codes		
Supply	Executive Secretary	14.0700	VEDS	
	Secretary	14.0702	VEDS	
	Stenographers	14.0703	VEDS	
	Secretarial Technology	5005	HEGIS	
	Secretary	201.362-030	CETA	
E3mqne	Secretaries	40020200	Census Matrix	
	Stenographers	40020400	Census Matrix	

Cluster Name Electricity and Electronics

Supply or Demand	Education/Training Programs or Occupations		Source Data System	Comments
	Titles	Codes		
Supply	Electricity	17.1002	VEDS	
	Electrical Occupations	17.1400	VEDS	
	Industrial Electrician	17.1401	VEDS	
	Electronics Occupations	17.1500	VEDS	
	Industrial Electronics	17.1501	None	
	Electronics & Machine Technologies	5310	HEGIS	
	Construction & Building Technologies	5317	HEGIS	
	Electronics Assembler	726.684-018	CETA OJT	OJT may duplicate current employment
Demand	Electric tool repairers	50083205	Census Matrix	
	Electric meter installers	50082002	Census Matrix	
	TV servicers & repairers	50082602	Census Matrix	
	Electricians	50021400	Census Matrix	
	Instrument repairers	50083221	Census Matrix	
	Inspectors	50142202	Census Matrix	These occupations may overlap into
	Testers	50142205	Census Matrix	other Units of Analysis.
	Assemblers	61080402	Census Matrix	

V. CONCLUSIONS AND LIMITATIONS

Limitations

- Although the response rate on this survey was exceptionally high, the results cannot be readily generalized to all Montana education and training personnel. This is due to the fact that the sample was not scientifically defined to represent this larger population. The survey results can best be described as presenting the views and perceptions of 92 informed Montana agency personnel.

- The survey instrument presented a number of technical information topics that were to be rated in terms of their importance, use, and data availability to the survey reader. The analysis of the survey findings in this report assumes that the understood the meaning of these technical terms.

Conclusions

Section B--Data Importance, Availability, and Use

- Survey readers were able to differentiate between information topics.

- The highest-rated topics (in terms of data importance) from each area were:

  - Projected Job Openings by Occupation
  - Enrollment in Training/Education Institutions
  - Entry Requirements
  - Financial Assistance Programs.

- The three highest-rated topics in each area were covered, in some form, by 4 to 16 Montana sources (see Tables 10, 11).

- The most frequent availability and use rating for all respondents, across all topics, was that this type of information was not received but was needed.

Section C--Data Application and Training Needs

- Occupational information is most frequently used in program planning and career guidance and counseling.

- Respondents expressed a positive interest in training related to occupational information, with occupational demand rating highest and complementary rating the lowest.

Section D--Comments

- Respondents were generally positive about the survey, but expressed concern about the follow-up and use of their information. (See Appendix B)

Recommended Action

- Montana SOICC should review these findings and insure they are reflected in the following two developmental activities:
  - OIS Feasibility Study
  - Proposal for a Career Information Delivery System (CIDS)
- Montana SOICC should review these findings as they relate to the occupational information training needs of Montana education and training personnel.
  - This review should consider the findings, described above, that the most highly-rated topics are covered by existing Montana sources but are not received by most respondents.

PRELIMINARY REPORTS

1980 Census of Population and Housing

PHC80-P-28

MONTANA

Preliminary Population and Housing Unit Counts

This report is based on preliminary counts of population and housing units as compiled in the 1980 census district offices. The series consists of 56 reports—number 1 for the United States; numbers 2 through 52 for the States and the District of Columbia in alphabetical order rather than in order of publication; and numbers 53 through 56 for Puerto Rico, Guam, Virgin Islands, and American Samoa. Preliminary counts for the Northern Mariana Islands and the remainder of the Trust Territory of the Pacific Islands are not part of this series of reports. These counts will be made available in a separate press release issued for each area.

As of April 1, 1980, the population of the State was 783,698, according to a preliminary count of the returns of the 1980 census. This figure represents an increase of 89,289, or 12.9 percent, from the 694,409 inhabitants enumerated in the 1970 census.

The preliminary count of housing units in the State as of April 1, 1980, was 326,780. This figure, which includes both occupied and vacant housing units, represents an increase of 80,177, or 32.5 percent, from the 246,603 units enumerated in the 1970 census.

This report presents preliminary 1980 census population and housing unit counts for the State, counties, county subdivisions, incorporated places, standard metropolitan statistical areas (SMSA's), and congressional districts.

For SMSA's which have component parts in another State(s), data shown in this report relate only to this State's portion. For the remainder of the SMSA data, see the appropriate State(s) report.

These preliminary figures will be superseded by the final counts to be shown in Advance Reports, series PHC80-V, which will be issued within the next few months. The final counts are subject to further processing and review and may differ from the preliminary figures.

An outline of the publication and computer tape program for the 1980 Census of Population and Housing can be obtained free of charge from the Data User Services Division, Bureau of the Census, Washington, D.C. 20233.

Symbols used in tables. A dash "-" represents zero. Three dots "..." means not applicable, and "(NA)" means not available. The prefix "r" indicates that the count has been revised since publication of 1970 census reports.

Issued December 1980

U.S. Department of Commerce
BUREAU OF THE CENSUS

For Sale by the Bureau of the Census and U.S. Department of Commerce District Offices, 35 cents

Table 2. Population and Housing Unit Counts for Incorporated Places: 1980 and 1970

(Counts relate to incorporated places as delineated at each census. Information on boundary changes will be shown in the PC80-1-A report for this State. For meaning of symbols, see text)

Incorporated Places	Counties	Population		Housing units	
		1980 (preliminary)	1970	1980 (preliminary)	1970
Alberton town	Mineral	379	363	179	135
Anaconda-Deer Lodge County	Deer Lodge	12 507	9 771	5 189	3 693
Bainville town	Roosevelt	246	217	103	82
Baker city	Fallon	2 357	2 584	983	864
Bearcreek town	Carbon	61	31	30	21
Belgrade town	Gallatin	2 342	1 307	865	422
Belt city	Cascade	819	656	343	232
Big Sandy town	Chouteau	836	827	368	343
Big Timber city	Sweet Grass	1 686	1 592	797	683
Billings city	Yellowstone	68 361	61 581	28 564	21 013
Boulder town	Jefferson	1 439	1 342	533	331
Bozeman city	Gallatin	21 611	18 670	7 951	5 736
Bridger town	Carbon	724	717	346	290
Broadus town	Powder River	715	799	337	294
Broadview town	Yellowstone	125	123	45	40
Brockton town	Roosevelt	375	401	92	89
Browning town	Glacier	1 226	1 700	420	491
Butte-Silver Bow	Silver Bow	37 064	23 368	15 640	9 738
Coscade town	Cascade	774	714	315	266
Chester town	Liberty	953	936	462	329
Chinook city	Blaine	1 662	1 812	795	696
Choteau city	Teton	1 789	1 586	827	660
Circle town	McCone	933	964	418	344
Clyde Park town	Park	282	244	119	82
Columbia Falls city	Flathead	3 103	2 652	1 161	845
Columbus town	Stillwater	1 436	1 173	599	476
Conrad city	Pondera	3 074	2 770	1 296	977
Culbertson town	Roosevelt	885	821	382	298
Cut Bank city	Glacier	3 698	4 004	1 575	1 445
Darby town	Ravalli	577	538	275	198
Deer Lodge city	Powell	4 011	4 306	1 665	1 482
Denton town	Fergus	356	398	168	158
Dillon city	Beaverhead	3 980	4 548	1 696	1 675
Dodson town	Phillips	159	196	79	81
Drummond town	Granite	410	494	186	208
Dutton town	Teton	361	415	176	162
East Helena town	Lewis and Clark	1 643	1 651	659	524
Ekalaka town	Carter	615	663	313	292
Ennis town	Madison	660	501	313	259
Eureka town	Lincoln	1 127	1 195	448	398
Fairfield town	Teton	655	638	314	266
Fairview city	Richland	1 351	956	531	360
Flaxville town	Daniels	142	185	68	75
Forsyth city	Rosebud	2 550	1 873	1 053	768
Fort Benton city	Chouteau	1 697	1 863	716	696
Froid town	Roosevelt	323	330	143	133
Fromberg town	Carbon	470	364	204	142
Geraldine town	Chouteau	307	370	150	146
Glasgow city	Valley	4 458	4 700	1 992	1 820
Glendive city	Dawson	6 031	6 305	2 483	2 203
Gross Range town	Fergus	137	181	81	65
Great Falls city	Cascade	56 568	60 091	23 925	20 755
Hamilton city	Ravalli	7 657	2 499	1 373	1 116
Hardin city	Big Horn	3 288	2 733	1 358	990
Harlem city	Blaine	1 010	1 094	397	391
Harlowton city	Wheatland	1 178	1 375	591	605
Havre city	Hill	10 842	10 558	4 490	3 586
Helena city	Lewis and Clark	23 818	22 730	10 131	8 048
Hingham town	Hill	182	262	101	95
Hobson town	Judith Basin	253	192	116	90
Hot Springs town	Sanders	606	664	312	470
Hysham town	Treasure	449	373	195	162
Ismay town	Custer	32	40	20	15
Joliet town	Carbon	578	412	274	191
Jordan town	Garfield	482	529	241	241
Judith Gap city	Wheatland	211	160	90	54
Kalispell city	Flathead	10 299	10 526	4 602	3 955
Kevin town	Toole	211	250	103	95
Laurel city	Yellowstone	5 469	4 454	2 231	1 532
Lavina town	Golden Valley	164	169	91	75
Lewistown city	Fergus	7 079	6 437	2 930	2 529
Libby city	Lincoln	2 748	3 286	1 101	1 065
Lima town	Beaverhead	271	351	162	156
Livingston city	Park	6 998	6 883	3 132	2 815
Lodge Grass town	Big Horn	776	806	215	207
Malta city	Phillips	2 365	2 195	1 029	875
Manhattan town	Gallatin	987	816	402	296
Medicine Lake town	Sheridan	407	393	198	164
Melstone town	Musselshell	237	227	85	87
Miles City city	Custer	9 586	9 023	4 166	3 403
Missoula city	Missoula	30 735	29 497	13 595	10 313
Moore town	Fergus	229	219	96	76
Nashua town	Valley	496	513	241	206
Neihart town	Cascade	91	109	64	115
Opheim town	Valley	210	306	109	125
Outlook town	Sheridan	122	153	63	51
Philipsburg town	Granite	1 131	1 126	503	421
Plains town	Sanders	1 076	1 046	443	392
Plentywood city	Sheridan	2 455	2 381	1 044	847
Poplar town	Roosevelt	190	189	84	89
Red Lodge city	Carbon	2 840	2 464	1 363	962
Richey city	Dawson	413	389	171	152
Ronan city	Lake	1 528	1 347	669	511
Roundup city	Musselshell	2 112	2 116	1 079	949
Ryegate town	Golden Valley	277	261	131	115
Saco town	Phillips	251	356	150	154
St. Ignatius town	Lake	874	925	341	289
Scobey city	Daniels	1 385	1 486	658	593
Shelby city	Toole	3 147	3 111	1 351	1 184
Sheridan town	Madison	641	636	295	275
Sidney city	Richland	5 723	4 543	2 296	1 637
Stanford town	Judith Basin	595	505	284	216
Stevensville town	Ravalli	1 187	829	498	343
Sunburst town	Toole	476	604	220	203
Superior town	Mineral	1 052	993	439	362
Terry city	Prairie	927	870	408	383
Thompson Falls town	Sanders	1 470	1 356	615	502
Three Forks town	Gallatin	1 245	1 188	553	446
Townsend city	Broadwater	1 566	1 371	658	487
Troy town	Lincoln	1 064	1 046	418	399
Twin Bridges town	Madison	437	613	233	204
Valier town	Pondera	638	651	275	229
Virginia City town	Madison	193	149	123	83
Walkerville city	Silver Bow	886	1 097	381	395
Westby town	Sheridan	291	287	136	100
West Yellowstone town	Gallatin	732	756	432	354
Whitefish city	Flathead	3 582	3 349	1 635	1 225
Whitehall town	Jefferson	1 040	1 035	489	393
White Sulphur Springs city	Meagher	1 298	1 200	572	510
Wibaux town	Wibaux	784	644	348	258
Winifred town	Fergus	155	190	79	80
Winnett town	Petroleum	209	271	116	122
Wolf Point city	Roosevelt	3 073	3 095	1 251	1 085

PRELIMINARY COUNTS

Documentation of Cost Information

The cost information presented for the OIS design alternatives in Chapter 4 are based on the following information:

- ADP Operating Costs--This includes computer time, test runs and keypunch services. The estimates provided are based on the operating experience of Program Resources, Inc. in working with the Missouri SOICC in developing their OIS system.

- Personnel Salaries--The data provided in Exhibit 4-10 are rounded data based on the salaries from the 1981-82 Montana State Pay Plan (assume 18% Fringe Benefits)

	Salary	Salary and Fringe benefits
- Programmer (Grade 13 step 4)	$16,195	$19,109
- Program Manager III (Grade 13 Step 1)	$14,763	$17,420
- Clerk-Typist (Grade 6 Step 1)	$ 8,309	$ 9,805